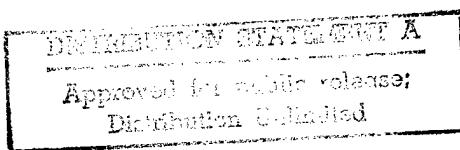




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S&T POLICY

EC Adopts New JESSI Budget

92WS0143A Paris AFP SCIENCES in French
31 Oct 91 p 14

[Article entitled: "JESSI: The EC's Contribution Shrinks '92 Budget 25 Percent"]

[Text] Munich—The 1992 budget for the European research program JESSI (Joint European Submicron Silicon) will be cropped nearly 25 percent over initial estimates because of the drop in the European Community's contribution, disclosed JESSI's management 25 October.

A budget of 400 million ecus was adopted at the close of the meeting this week between JESSI's board of directors and JESSI Committee members representing the governments of the countries affected. JESSI officials hope, however, that the EC will restore its share to the previously expected level.

The effective startup of 70 programs was approved. Among the programs' "admiral ships" are high definition television (HDTV), digital radio broadcasting, digital cellular telephony, and digital telecommunications networks.

In a communique, JESSI's board of directors underscored its satisfaction with the way the governments of the countries involved are coordinating their efforts. On the other hand, it expressed its concern about the European Community's position, pointing out that "a full commitment on the part of all JESSI partners was necessary to meet the needs of the European electronics industry."

The ratification last month of the agreement with the American program SEMATECH (Semiconductor Manufacturing Technology) was a fresh sign of the EC-United States declaration of war against Japan in the field of electronics, notably in the world microprocessor market. The latter represents the enormous sum of 70 billion dollars. JESSI embraces over 100 companies working together on 60 research programs, including the development of a super-microprocessor with memory capacity of 64 megabits.

European Association for Astronomic Research Created

92WS0245A Paris LE MONDE in French
18 Dec 91 p 11

[Article by special correspondent in Cambridge (U.K.), Catherine Vincent: "Creation of the European Astronomic Research Association: The Europe of Laboratories"; first paragraph is LE MONDE introduction]

[Text] The first Associated European Laboratory (LEA) was inaugurated on Monday 16 December in Cambridge (Great-Britain). Created for a renewable four-year

period, the European Astronomic Research Association will ally the resources of the Cambridge Institute of Astronomy, the Leiden (Netherlands) Sterrewacht, and the Paris Astrophysics Institute (CNRS [National Center for Scientific Research]).

Great-Britain may well have remained aloof at the Maastricht summit: It was in Cambridge, this week, that the Europe of laboratories was born. When they signed the charter convention of the European Astronomic Research Association, Mr. Francois Kourilsky, the CNRS general director, Sir David Williams, vice chancellor of the Cambridge University, and Mr. Oomen, chairman of the Leiden University council, inaugurated a new form of European scientific cooperation. In the best British tradition, light-years away from the Brussels "Eurocracy."

"We must create the Europe of laboratories, not the Europe of bureaucracies," Mr. Kourilsky insisted. Initiated by the CNRS, the Associated European Laboratories will serve as a testing ground. Their objective is to "regroup teams from several countries, who agree to pool their human and material resources for several years in order to complete a research program." They will not for all that leave their respective laboratories; they will use a loose structure headed by an independent directorate to reduce the administrative and cultural unwieldiness that usually hinder international scientific cooperation.

The CERN [European Nuclear Research Center] (Geneva), the ESRF [European Synchrotron Radiation Facility], and the Grenoble High Magnetic Field Laboratory are several such European laboratories that were created in the past. But most of them were built around heavy equipment or specific techniques. "However, several European teams now wish to cooperate in another way, remaining where they are and retaining their current management systems," Mr. Pierre Radvanyi, advisor to the CNRS international relations mission, pointed out.

Specialized in the study of galaxies and the structure of the Universe, the three laboratories involved in the European Astronomic Research Association rank, in this field, among the best in their respective countries. During the (renewable) four years of operation of this first LEA, they will retain their own resources and their management independence. But they will devote at least half of their research time to the joint program. The program, on which about 50 researchers will work, will get a budget of about 5 million francs [Fr] per year, two-thirds from the laboratories' current budgets, and the remaining one-third from specific resources.

Two other LEA's should be inaugurated in Perpignan on 14 January 1992. The SIMAP (Material and Process Sciences and Engineering) will consist of the Odeillo Material Science and Engineering Institute, the Montpellier Material Physics and Chemistry Laboratory, and the

Barcelona Material Sciences Institute. The Plant Molecular and Cellular Biology Laboratory, for its part, will bring together a team from the Perpignan University and a Barcelona research institute. Later on, a fourth LEA will be established in Berlin; it will be devoted to surface and interface magnetism. It will then be time to draw up a first assessment of these pilot experiments. And to find out whether, as Mr. Kourilsky hopes, "scientists working together have taught research organizations how to work together."

EUREKA Program Criticized for Lack of Industrial Policy

92WS0175A Paris *L'EXPANSION* in French 21 Nov 91 pp 124-131

[Article by Richard Clavaud: "EUREKA's [European Research Coordination Agency] Fizzles"; first two paragraphs are *L'EXPANSION* introduction]

[Text] Europe's big research program has mobilized a great deal of money with little to show for it.

EUREKA, which was launched six years ago under the impetus of Francois Mitterrand, has not really lived up to its promises. True, it has enabled small and medium companies to collaborate across national lines on specific projects. But it has not really created a common front of Europe's big groups in areas where American and Japanese competition made it desirable to combine forces—notably in electronic memories and high-definition television. What follows is an autopsy of a partial failure.

"EUREKA is one of Europe's surest successes." Francois Mitterrand, who proposed the large-scale research program to the Europeans six years ago, sticks up for his baby. Yet the goal set by the Hanover Conference in 1985—to improve the competitiveness of European industry—is far from being achieved. How else can one explain the dismal state of the European computer and electronics industries? And where are the new products developed by EUREKA?

The requirements of competition have stymied the development of real technological cooperation between the big groups. "EUREKA was supposed to help Europe recapture markets; the lack of an industrial policy may reduce the program to a simple association of laboratories," analyzes Jean-Baptiste de Boissiere, the coauthor of *LA NOUVELLE FRONTIERE DE LA TECHNOLOGIE EUROPEEENE* (The New Frontier of European Technology), published by Calmann-Levy.

EUREKA is very attractive on paper. Over 3,000 companies, laboratories, and research centers from 19 countries are now working together on projects that range from high-definition television to future materials, flexible shops, and smart cars. According to Philippe Desmarescaux, head of research and agrochemistry at Rhone-Poulenc, participants seem to be satisfied. "Companies appreciate EUREKA's flexibility, especially when

it comes to writing up proposals, and its bottom-up approach, which leaves the initiative in defining projects and choosing partners to them." Some small and medium firms have been able to profit from these virtues.

Take the Frenchman Roger Pellenc and the Spaniard Fernando Albajar. Despite the fact that they work in the same industry—agricultural machinery—they would probably never have met without EUREKA. But together they have been developing the "Citrus" robot to harvest citrus fruit for two years now.

There are over 260,000 hectares of orange trees in the world, and the manpower needed to pick the fruit they produce is starting to become scarce, even in Spain. Selling 1,000 machines a year seems a reasonable goal, especially since the two bosses are not starting from scratch. Roger Pellenc already developed an apple-picking robot in collaboration with the Montpellier Center for the Study of Agricultural Machinery; his Spanish partner is associated with an agricultural institute in Valencia that specializes in citrus fruits.

For them, EUREKA means first and foremost a sort of recognition. "Because of the EUREKA label, my company is considered a high-technology, European firm," exults Roger Pellenc, a former industrial-design professor who also has a machine to sniff out truffles and a hydraulic dryer to his credit.

Of course, cooperation is a learned art. Each one has his own idea about how to construct Citrus, resulting in the development of two different prototypes. But the 45 million French francs [Fr] in government loans promised by France and Spain (35 percent of the total cost) were too good to pass up. So—it's a promise—there will be only one version of Citrus. And although Pellenc insisted on owning a majority stake in the future company to market the robots, Albajar will be given priority to build them. For these two small companies, EUREKA is an effective cement.

Even among the big groups, the European program has had its successes. Residents of Tartas (Landes) call the Saint-Gobain factory "first in filth." That may change. Engineers in the pulp division and their colleagues in the biotechnologies mission have devised "clean" technologies for the manufacture of pulp in cooperation with the Finnish firm Kultor. "Instead of using chlorine to attack the wood, we set enzymes to work," explains Jean-Luc Fuentes, the science director of Biopulp International, which is the subsidiary created by Saint-Gobain and Kultor to market the process.

Other examples include the Lyon Water Company, which sells treatment plants using microfiltration films that it developed with Denmark's DDS; Niort's Tecnal, which automated the Spanish company Campofrio's ham-production plant; Grenoble's Itmi, which developed industrial robots together with Italians and Germans; and Brittany's Guyomarc'h, which thanks to its

collaboration with a Swiss and an Austrian firm is selling a "growth factor" used to fortify animal feed.

"Over 60 percent of the projects should spawn new products," hopes Philippe Desmarescaux. Besides being a cement, then, EUREKA is also a catalyst. But at what rate and for what kinds of projects?

Six years after EUREKA's inauguration, not more than 20 projects have been completed. Most important, their impact on the competitiveness of European industry—the program's chief objective—remains limited to say the least. As for the truly strategic projects, they are floundering.

The two megaprojects JESSI [Joint European Submicron Silicon Initiative] (highly integrated electronic memories) and HDTV (high-definition television) receive packages of Fr27 and Fr5 billion respectively, or half of EUREKA's funding. But the stumbling blocks among its main beneficiaries (Philips, Siemens, SGS, and Thomson) are now patent.

And yet these giant electronics firms have every reason to cooperate. By the year 2000 a plant to manufacture integrated circuits will cost 2 billion dollars, an investment that is virtually out of the reach of most European chip manufacturers. The solution is to unite. The same is true for the future generation of televisions. If the Old World's manufacturers each develop their own incompatible standards, as they did for color television (Pal and Secam), the Japanese will walk away with the ballpark.

Three years after its instigation, however, JESSI has become a full-blown hydra: A hundred companies are working on nearly 70 projects ranging from basic research to equipment, technologies, and hardware. It is hard to size it all up. One thing is certain—money is scarce. Forced to tighten the screws, Philips's new president Jan Timmer has partially withdrawn from JESSI. "We will have to make up for Philips's withdrawal among ourselves and persuade our governments to split the Dutch company's share," explains JESSI's spokesman Klaus Knapp.

There is a strong chance that JESSI's difficulties will unsettle EUREKA, for many programs such as Carminat (information, management, and guidance of vehicles) or HDTV depend on electronics. By the year 2000 components will account for 20 percent of the price of an automobile and 90 percent of the price of a television. Yet no one wants to grant an extension. The Germans have to finance their reunification. The European Commission, a EUREKA member, has just limited its assistance to Fr2.8 billion, or 25 percent less than promised.

Although the HDTV project is farther along, it also has a serious case of the hiccups. European high-definition television is an offshoot of the Japanese threat. Sony and the NHK (a big Japanese television channel) have been working on the technology for 20 years now. Their goal is

to impose their standards of production and broadcasting on the whole world, while snatching up the largest catalogs of audiovisual rights (hence the buyout of Columbia by Sony). Caught between Japanese hard and software, the Europeans are likely to be steamrollered. EUREKA could forestall this catastrophic scenario, for Bosch, Nokia, Philips, and Thomson are working double time to catch up. Thomson just presented a receiver prototype with an integrated high-definition decoder in Berlin. It is slated to go on the market near the end of 1993 priced at Fr60,000. Too expensive you say? Yes, but costs will drop "and the product will be available two years ahead of schedule," promises Bernard Isautier, the president of Thomson Consumer Electronics.

So much for the visible tip of the HDTV iceberg. Beneath the surface the program is running up against the hard realities of national markets. To try to save its TDF1 program of direct satellite broadcasting, France wants to retain the standard that was especially designed for the ruinous machine, the D2 MAC. Consequently, the latter was promoted to the status of an "interim standard" for high definition. Holland's Philips has no time for either TDF1 or the D2 MAC. It would prefer to move directly to real high-definition television. Foreign broadcasters find the D2 MAC extremely irritating. The British, who insist on keeping their frequencies, have opted for a different version, the C MAC, while the Germans and Luxemburgers swear by their Pal and its improved version Pal Plus. As a result, EUREKA must compromise, which leads to some aberrations. For instance, last 26 June the European Commission submitted a directive to the Twelve making the use of the D2 MAC for satellite television services mandatory. At the same time, EUREKA awarded its label to a German-British project to develop the competing standard Pal. Europe, a technological Tower of Babel. Who will foot the bill for these tussles? The companies, to start with, for they are falling behind. During the "Sony World" exhibition that was recently held in Paris, the Japanese manufacturer caused a sensation by presenting in turn a prototype for a multistandard television set that is compatible with the D2 MAC. But consumers will pay as well, in the form of over Fr100 billion in additional expenditures for the famous "interim standard", according to a recent audit by the Coopers & Lybrand firm.

How can Europe regain equal footing with Japan? "By increasing funding," plead some manufacturers. It is true that the Fr82 billion allocated to EUREKA account for less than 2 percent of Europe's research and development expenditures. The question is whether that is really the problem. Contrary to popular conception, Europe's research is not ailing (see the interview with Hubert Curien, page 130), but it is better at marrying weak partners than strong ones. With the exception of the electronics industry, its best-performing companies prefer spiking each others' guns to collaborating on strategic projects. And the policy of promoting national champions does not help matters. "I have a hard time

imagining Alsthom and Siemens working together on the TGV (high-speed train) of the future, when they eviscerated each other in the United States," admits Serge Gregory, France's national coordinator for the EUREKA program.

EUREKA's powerlessness to bring about collaboration among large European groups is even more obvious in the chemicals industry. This is brought home to the observer in Leverkusen, a German city. Aspirin, Dralon, Baygon, and Agfa pellets are all products of Bayer, the world's fourth-largest chemicals-pharmaceuticals firm. Its research and development division employs 16,000 people working on nearly 2,000 projects, with an annual budget of 3 billion German marks [DM]. Its library, the Kekule, is the world's largest collection in chemistry.

The German giant did, of course, make a few efforts to participate in EUREKA. The company is a large supplier of molded plastics to the French automobile industry, and worked, notably, with Peugeot Co. on the Carmat project to develop new materials. But its composite floorboards and doors were too costly for the French group, and Bayer withdrew from the project.

Settled in an office in the Leverkusen factory, Dr. Hauke Furstenwerth, coordinator of research and development, gives his frank opinion of EUREKA. "The program is full of good intentions, but it is not for us. Our researchers are competent enough to develop new products, and if we identify companies with valuable know-how, we ask them to collaborate with us or we buy them out. Finally, we do not expect subsidies from the state, we expect fair tax policy and regulations." No comment.

Rhone-Poulenc is also going it alone. But it does not spit on public monies. Jean-Rene Fourtou's group is one of the principal beneficiaries of the public industrial-research funds that were announced last October. A package of nearly Fr2.5 billion will be given to biology, highway safety, and the environment, including Fr600 million for Bioavenir, a program "at the frontier between chemistry and the life sciences." What about EUREKA? The company is involved in three projects that it describes in house as "secondary": artificial seeds for tomatoes, drought-resistant sunflowers, and filtration films. "If our participation is limited, it's because there are very few examples of new products developed collaboratively," explains Philippe Desmarescaux. "That said, the dizzying escalation of development costs should force European chemical makers to collaborate." So why launch Bioavenir all alone?

Six years after its startup, EUREKA is definitely at mid-stream. Its 19 member countries must decide whether it is better to transform the program or hold on to the initial objective of improving the competitiveness of European industry. If transformed, the program could become a European club for technological brainstorming, or a financial network to grant subsidies to

ailing companies (EUREKA funds escape the oversight of the formidable Leon Brittan and most countries refuse to divulge the amount.)

To Francois Mitterrand, the answer is clear: Europe must persevere. France will assume the presidency of EUREKA in 1992; it should take advantage of the office to restart the machine. It should do so by cleaning house and by trying to push strategic projects. But the 19 member countries would also have to follow its lead.

Although each state has a perfect right to initiate large national research programs like the one France has just announced, does it make sense that there are no bridges between EUREKA and EC programs such as ESPRIT (information science technologies) or BRITE-EURAM (materials and manufacturing technologies)? "It's as if the Commission were a much bigger believer in the marketplace than in cooperation and public policies as a way of energizing European technology," regretfully notes Jean-Baptiste de Boissiere. On the one hand, the competition commissioner Leon Brittan is very careful to see to it that EC-financed projects remain "precompetitive." On the other, EUREKA's artisans manage projects financed by the states, and are committed to seeing them reach the marketplace. The two approaches are incompatible, unless the famous bridges between the downstream (EC projects) and the upstream (EUREKA) can be established. Until the big European groups are convinced that it is in their interest to collaborate, and until the governments and the European Commission agree to back up this technological cooperation with a coherent industrial policy, there will be no reason to cry "Eureka!"

[Boxed material]

Hubert Curien: "I Would Like To See the Community Abandon Its Legal Pointillism"

Hubert Curien was minister of research and technology from 1984 to 1986 and has acted as the president of EUREKA's interministerial committee since 1988. He is a fervent partisan of international cooperation. The large-scale strategic projects that he has just launched could develop within the structure of EUREKA...if French manufacturers decide that they should.

L'EXPANSION: What is your overall assessment of EUREKA today, and in particular of the HDTV and JESSI projects?

Curien: The concept is unarguably a good one. Companies appreciate EUREKA. Thanks to the program, they can enrich their address books, better define their markets in Europe, and improve their position in relation to the Americans and the Japanese. It helps small and medium companies to form international alliances.

The HDTV project made possible the effort necessary to resist the pressure from Japan. Now we must make sure the timetables are met. Without JESSI, I am not sure that electronics manufacturers would have agreed to define

programs jointly. But the project must be focused, for I am afraid that if the bases for cooperation are expanded, the large program will be watered down.

L'EXPANSION: What do you think of the relations between EUREKA and the EC research programs?

Curien: They should be made more complementary. The EC is only participating in 20 EUREKA projects. Generally, I would like to see the Community initiate some industrial policies that would be beneficial to Europe and abandon a legal pointillism that is not always the greatest asset. The essential thing is not to play policeman but to shore up our positions relative to foreign competitors.

L'EXPANSION: The European Commission is very sensitive to anything that might resemble subsidies. But don't large manufacturing groups such as Thomson tend to look at EUREKA as a source of subsidies?

Curien: EUREKA operates on a principle that is close to my heart, the principle of contracts. Governments do not hand out money to anyone who asks for it, but to those who commit themselves to concrete projects and verifiable results. It is much more effective. Moreover, we hope to take advantage of France's presidency in 1992 to instigate a series of audits of EUREKA's industrial and economic repercussions. It will also be an opportunity to initiate large strategic projects in the following four areas: computers and software, automobiles, factories of the future, and waste treatment.

L'EXPANSION: Is the admission into EUREKA of non-European groups such as IBM a good way to improve the competitiveness of our companies? Aren't they, to the contrary, their most dangerous rivals?

Curien: We hesitated for a long while, but the fact that IBM, for instance, is in EUREKA does not bother me. On the contrary, I see three advantages to it: The group is a good manufacturer, it plays by the rules in conducting its business in Europe, and it is a valuable beachhead into the United States. Let's not have a blinkered view: "Europe and Europe only" is not necessarily the gospel that will get us to paradise.

Denmark: Growing, Still Modest Research Effort Reported

92WS0131A Copenhagen BERLINGSKE TIDENDE
in Danish 6 Nov 91 p 4

[Article from Ritzaus News Agency: "Danish Research Doubled"; first paragraph is BERLINGSKE TIDENDE introduction]

[Text] Research: A report on Danish research shows a modest effort from an international viewpoint in spite of an increase

In the last 10 years the Danish business sector has doubled its research effort.

However research is still modest in an international perspective, according to the report released by the Education Ministry, "Developments in Research and Technology in the 1980's."

The reason for the modest research effort is that Danish industry has a preponderance of branches with a low research and development intensity and a corresponding shortage of branches with a high research intensity. At the same time the business structure is characterized by many small and medium-size firms and only a few big ones.

"One of the positive results in the private sector's research effort is that the high-tech branches' share of the total industrial research effort rose from 42 to 54 percent between 1979 and 1987," said section manager John Sarborg Petersen of the Education Ministry's research section.

High Technology

He pointed out that the research effort of the high-technology branches measured as a percentage of total research is now higher in Denmark than in the other Nordic countries.

Total Danish research rose from 0.96 percent of the gross national product in 1979 to 1.53 percent in 1989. That is a little above the growth in most of the OECD lands and amounts to a good 12 billion kroner a year.

In the public sector research was characterized by big upheavals in the 1980's. Research has been "internationalized" and external funding of research has risen much more than funding through basic appropriations.

External Funding

External funding has risen in particular for the natural sciences, engineering, agricultural research and veterinary science, partly because Denmark has started big research programs in biotechnology, materials technology and information technology.

Outside money to institutions of higher education has increased the share of basic research in agricultural and veterinarian science and to a lesser extent in social science. In other research fields the external funds had a "neutral" impact on basic research.

The report documents that industrial research efforts have become even more concentrated in the high-tech branches.

Gains and Losses

The report establishes that Denmark lost market shares on a number of "research-intensive" markets in the 1980's, but in return maintained or increased market shares on a number of low-tech markets.

"Viewed in a long-term perspective it is a problem that Denmark's export specialization is concentrated on the

technologically less advanced production areas, as increased competition from the newly-industrialized and East European countries can be expected in precisely these areas," the report says in its summary.

Denmark's Strengths

At the same time the report warns against one-sided concentration on high-tech branches:

"Denmark's strength lie in the development groups: food products, construction/housing, health and transportation. These areas make up a large part of the export products Denmark specializes in, but the development groups have a relatively low combined growth potential."

France, Germany Negotiating Compromise on ESA Program

91WS0161A Paris *LE MONDE* in French
19 Nov 91 p 20

[Article by Jean-Francois Augereau and Jean-Paul Dufour: "Difficult Franco-German Compromise"]

[Text] Europe's future in space hangs in the balance. The ministers of 13 countries (Germany, Austria, Belgium, Denmark, Spain, France, Ireland, Italy, Norway, Netherlands, United Kingdom, Sweden, Switzerland) meeting in Munich 18-20 November are going to have to decide whether or not they want Europe to master the technologies of manned space flight.

This objective, though sharply contested by groups of scientists in several countries, does not seem to have been abandoned by the members of the European Space Agency (ESA)

Nevertheless, the cost of this ambitious program—which includes a space shuttle (Hermes), modules of a space station (Columbus), a heavy launcher (Ariane-5) and high-output telecommunications satellites (DRS) to connect all this hardware to ground stations—makes several countries more than a little nervous. Beginning with Germany, which has spent the whole year urging that expenses be cut and programs be stretched out longer. This has been done. But on the eve of the Munich meeting, Paris and Bonn, the two principal financial backers of European space cooperation, have fallen into disagreement.

Thus the conference could be tumultuous, and the financiers will doubtless look askance at the 300 billion French francs [Fr] they will have to sink into this program between 1992 and 2005.

"We must finally cross the Rubicon, move forward and commit ourselves firmly to follow through on the decision made in November 1987 at the space conference at The Hague. We must begin development of the Hermes shuttle, the Columbus space laboratory, and DRS satellites. We must also begin a serious program of environmental study. Besides, 12 of the 13 ESA member states are in agreement on these proposals which the agency has

made for its long-term program." The man is enthusiastic, sure of himself. He is French. He has no misgivings. Space is a priority, and man in space "an ambition." "Europe," he says, "ought to be a power in space alongside the United States, Japan and the Soviet Union, by the dawn of the next century." "Its political existence depends on it," adds Jean-Marie Luton, director general of the ESA. Doubtless many of ESA's member states agree with him. But it is one thing to talk about it, and quite another, in the current economic situation, to acquire the financial resources to carry it through. Not everyone is as lucky as France, which for more than 15 years has supplied the horsepower for the European space effort and significantly increased its appropriations. About Fr9 billion in 1990, Fr9.7 billion in 1991. That's not much compared to the spending of the two superpowers, but it is a lot for Europe.

With France so sure of itself, Europe is following its lead. Most of Europe. All the countries but one, and far from the least important: Germany, which next to France is the biggest financial backer of the European space effort. Without Bonn, which is rather winded, France's drive may be largely blunted in Munich. Without Bonn, the interministerial conference may turn into a procedural battle leading to a pathetic compromise based on a convoluted final communiqué proclaiming that everyone is happy, that everyone has done as much as they could, and that space activities will be continued, within the limits of what is "financially feasible" for the states.

Preserve Unity

Without Germany, finally, the European space effort and its ambitious programs could fall apart after years of relatively smooth sailing crowned by the brilliant success of the Ariane rocket. Of course, no one wants that to happen. Chancellor Helmut Kohl realizes a failure of European cooperation in this area would be disastrous on the eve of the European meeting at Maastricht. Likewise he is aware that the European space program has always been cited as a paragon of cooperation, and he does not want it to die at a conference held on German soil. So he has made a number of reassuring noises.

At the conclusion of the Franco-German summit 14-15 November in Bonn, Mr. Kohl said "no one had the intention of quitting." But, at the same time, the government coalition let it be known that it wanted to postpone its decisions on long-term European space programs until 1992. Jean-Daniel Levy, director general of the National Center for Space Studies [CNES], notes that despite the diplomatic tenor of the remarks, "a grain of sand has been slipped into a well-oiled process" which had been launched several months ago and was to be capped at Munich by the adoption of "logical and integrated" manned space programs.

Flagship Programs

No doubt, under these conditions, the Munich conference will be more than "a little tumultuous." The integration advocated by the French, who do not want the Hermes shuttle program to be separated from the rest of the program, will carry a high price-tag. So the finance people will carry more weight than the technicians. "However," explains one high-level French official, "we have already reduced the cost of all the programs, as the ESA member states requested. It would be difficult to cut any further."

Indeed, at the last space conference at The Hague in 1987, the Europeans had discussed an ambitious program costing more than Fr280 billion (40 billion European currency units at 1990 prices) over the period 1987-2005! ESA's "long-term activity plan" envisioned, among other things, the launching of three flagship programs.

No one has misgivings about the Ariane-5 heavy launch vehicle; most of the development commitments have already been made, and with outstanding orders totalling Fr13 billion the Ariane family (Ariane 2, 3 and 4) has pulled half the world civilian satellite market away from the Americans.

The space shuttle Hermes is promoted by France, but Germany, considering it too costly, wanted to turn into a mere "technological option."

Finally, there is the Columbus space station, consisting of a habitable laboratory (APM), part of the future American "Freedom" station, and an autonomous visitable module (MTFF).

Germany, which is taking the lead in the latter project, seems quite happy with it. But for France it is an issue of principle. "Hermes and Columbus form an integrated and inseparable whole," Levi insists. Without Hermes, the French maintain, Europe would have to rely on the United States to visit its orbiting laboratories, so one could not truly speak of European "mastery" of manned space activities.

Today, all the member states appear to share this view, though Germany only gives it lip service. Thus, in an effort to reach agreement with the Germans, every effort has been made to pare costs down. After two meetings, one early this year at Santa-Margharita and the other over the summer at Darmstadt, ESA drew up a new plan that cost 11 percent less than what had been discussed at The Hague. So it looked like all the groundwork had been laid for Munich to approve the broad outlines of the new European space program without further hitches.

In principle, cost-conscious Germany should have been pleased, since its contribution was reduced by 16 percent—more, in percentage terms, than any other country. Alas, Bonn continued its foot-dragging, for

budgetary and political reasons. The weight of reunification suddenly became heavier, it became more urgent to defend the German mark and control inflation, and the Social-Democratic opposition (SPD [Social Democratic Party]) came out in total opposition to the Hermes project.

Starting Over

It took all the tenacity the diplomats at the Bonn Franco-German summit could muster to avoid disaster. Friday afternoon, the Germans stuck to their position, pointing out that while they had the money for 1992, they had no assurance funds would be available for 1993, 1994 and 1995, so they could not make a four-year financial commitment at Munich. Paul Quiles, France's minister of space affairs, patiently "rolled the stone up the hill again" and at the eleventh hour managed to reach an agreement with his interlocutor, Heinz Riesenhuber.

In the final communique, France and Germany, without whom there would be no European space effort, declared that they sincerely "hoped to make the upcoming meeting in Munich a success" and reaffirmed their determination to "pursue a policy of European space cooperation, including both human exploration of space and the study of our planet and environment."¹ On the other hand, very little was said about the post-1992 period or financing the programs. But in an effort to reduce costs, the two countries asked the ESA to "study possibilities of cooperation with other partners around the world."

Meanwhile, Bonn and Paris might propose that ESA member states meet each year to consider the programs in relation to their respective financial capabilities. Thus Munich might decide on a modification of the agency's financing procedures whereby program financing would be voted on a yearly basis rather than all at once—in order to satisfy the German parliament, which is very anxious about these budgetary issues.

"Why not?" asks one French official. "The European ministers meet twice a year to consider the budgets for the Airbus program, which is only one-tenth as big as ESA's." This compromise is "acceptable," says another official, who believes that "if despite everything it comes to a rupture at Munich, better an open break than a moronic compromise."

Footnote

1. France, though in agreement on the necessity of a European environmental study and earth observation program, nevertheless has its own views on the way it should be approached. Whereas ESA has proposed heavy multimission platforms, France prefers (as does the United States now, apparently) lighter "dedicated" satellites, such as modifications of the civilian Spot platform.

France: Colloquium Assesses Regional Research
92WS0235A Paris AFP SCIENCES in French 5 Dec 91
pp 1-3

[Text] Paris—Launched last year, Operation Regional Research White Papers has led to the preparation of 411 projects, according to comments made 4 December in Paris by Mr. Bernard Decomps, director-general of research and technology for the Ministry of Research, on the occasion of the colloquium "Research, Regions, and Europe." This colloquium brought 300 French and European socio-economic, scientific and university managers together over a 3-day period to pursue in the discussion engendered by the 26 "white papers."

Operation White Papers was launched in the wake of the report *Recherche, technologie et développement régional* (Research, Technology and Regional Development), presented jointly in June 1990 by the ministers of research and land management (see AFP SCIENCES No 720, 7 Jun 90, p 1). Its purpose was to provide a specific inventory of research in each region in order to enable the strengthening or even restructuring of regional scientific poles that had a chance of recognition on a European scale.

Of the 411 projects that have emerged, 80 are "ready" and 70 others contain "good general ideas" but still need some refinement, according to Mr. Decomps. "In a few months, we should therefore have 150 projects ready," he added, speaking in the presence of Minister of Research Hubert Curien, who attended the opening of the colloquium organized under a new Ministry of Research program, "The Science Square."

During the five half-days, colloquium participants, who came not only from all over France, but from Belgium, Germany, Spain, and Finland as well, worked with

Community research officials to find answers to the following questions asked by managers and, often, researchers themselves:

- Research is today a concern for territorial development. However, its distribution throughout the territory cannot be achieved simply by balancing researchers, resources, and populations. It is also necessary to bring the national bodies responsible for decision-making and evaluation closer to the various regional administrative levels involved, as well as to university communities and business.
- Just as national and regional policy are intimately linked, so are national and European policy. The question then arises of how to develop European-class regional poles of excellence while at the same time respecting regional, national and European equilibriums.
- Relationships between research laboratories and businesses, particularly small and midsized companies and manufacturers, are formed at the regional level. The issue is therefore one of implementing balanced regional development that meets this requirement.
- Even with balanced regional development, it will not be possible for every region to have advanced laboratories in all the rapidly developing fields. What "new solidarities" should central governments help to create between regions in order to avoid both "technological deserts" and excessive concentrations?

An *Atlas régional de la recherche* (Regional Research Atlas) (150 francs) was also presented during the colloquium. Published by the Ministry of Research, this 200-plus-page document gives the principal research statistics for each of the regions of France. Its tables, graphs and 100 maps provide an overview of regional strengths and weaknesses in both government and private research.

Private Research Efforts: 1989 Internal Research and Development Spending
In millions of francs. Data corrected for statistical secrecy.

Region	Agriculture, Agribusiness	Energy	Ceramic, Glass Construction Materials	Iron & Steel, Metal Working	Mechanical Construction	Electrical, Electronic, & Computer Equipment	Chemical Industry	Pharmaceutical Industry	Transportation Equipment	Misc. Industries	Engineering	Other Services	Not Broken Down	Total
Alsace	53			99	418	131	27	29	120	15	18	16	926	
Aquitaine	141			9	63	195	530	91	1,815	253	33	27	306	3,465
Auvergne	46			45		67		175					1,736	2,069
Burgundy	28		13	91	86	283	244	126	82	57		5	5	1,021
Brittany	128			4	21	1,050	17			32	11		99	1,362
Center	209		37	39	66	202	88	296	271		11	14	208	1,441
Champagne Ardenne	40			43	19	52		46		90			47	338

Private Research Efforts: 1989 Internal Research and Development Spending
In millions of francs. Data corrected for statistical secrecy. (Continued)

Region	Agriculture, Agribusiness	Energy	Ceramic, Glass Construction Materials	Iron & Steel, Metal Working	Mechanical Construction	Electrical, Electronic, & Computer Equipment	Chemical Industry	Pharmaceutical Industry	Transportation Equipment	Misc. Industries	Engineering	Other Services	Not Broken Down	Total
Franche-Comte	11			21	74	143	36		1,171	48			28	1,533
Ile-de-France	644	2,487	274	400	666	16,952	3,811	3,686	15,712	1,379	708	1,459		48,176
Languedoc Roussillon	65			16		48	104	454		69	9	36	3	803
Limousin	29				11	129				14			73	256
Lorraine	49			440	66	36	91		5	161		18	80	946
Midi Pyrenees	123			30	33	341	198	293	2,867	37	10	52	84	4,068
Nord Pas-de-Calais	172		19	185	80	169	218	8	83	102		13	49	1,096
Lower Normandy	75			25	17	159	41		57	16			14	404
Upper Normandy	1	436	20	8	70	202		110	846	39	5		335	2,072
Pays de la Loire	155			64	107	649	24	18		153		12	252	1,432
Picardy	230		169	105	240	69	268	49	108	79		24	160	1,501
Poitou Charante	15			9	20	272	89	17	68	32		15	7	544
Province, Cote d'Azur and Corsica	108	29	64	89	24	1,869	590	126	1,976	106	200	160		5,341
Rhone Alpes	63			580	651	2,310	1,355	705	816	594	98	162	496	7,829
France except Ile-de-France	1,743	1,416	587	1,851	1,750	8,663	4,434	2,575	10,460	3,880	414	675		38,448
France	2,386	3,902	860	2,251	2,416	25,615	8,245	5,261	26,172	5,259	1,122	2,133		86,623

Private Research Efforts in 1989: Spending, Sector Distribution by Region
In percent. Data corrected for statistical secrecy.

Region	Agriculture, Agribusiness	Energy	Ceramic, Glass Construction Materials	Iron & Steel, Metal Working	Mechanical Construction	Electrical, Electronic, & Computer Equipment	Chemical Industry	Pharmaceutical Industry	Transportation Equipment	Misc. Industries	Engineering	Other Services	Not Broken Down	Total
Alsace	5.72				10.69	45.16	14.14	2.90	3.11	12.95	1.63	1.94	1.77	100
Aquitaine	4.07			0.27	1.82	5.64	15.31	2.64	52.39	7.29	0.95	0.79	8.84	100
Auvergne	2.23			2.19		3.22		8.46					83.90	100
Burgundy	2.78		1.32	8.87	8.42	27.70	23.93	12.36	8.03	5.60		0.53	0.46	100

Private Research Efforts in 1989: Spending, Sector Distribution by Region
In percent. Data corrected for statistical secrecy. (Continued)

Region	Agriculture, Agribusiness	Energy	Ceramic, Glass Construction Materials	Iron & Steel, Metal Working	Mechanical Construction	Electrical, Electronic, & Computer Equipment	Chemical Industry	Pharmaceutical Industry	Transportation Equipment	Misc. Industries	Engineering	Other Services	Not Broken Down	Total
Brittany	9.37			0.32	1.56	77.10	1.21			2.34	0.81		7.29	100
Center	14.47		2.59	2.73	4.56	14.01	6.14	20.51	18.31		0.77	0.99	14.42	100
Champagne Ardenne	11.86			12.75	5.52	15.55		13.63		26.64			14.05	100
Franche-Comte	0.74			1.40	4.85	9.31	2.34		76.38	3.15			1.83	100
Ile-de-France	1.34	5.16	0.57	0.83	1.38	35.19	7.91	7.65	32.61	2.86	1.47	3.03		100
Languedoc Roussillon	8.14			1.94		5.98	12.93	56.54		8.58	1.11	4.45	0.31	100
Limousin	11.30				4.29	50.38				5.50			28.51	100
Lorraine	5.18			46.45	6.98	3.64	9.63		0.56	16.98		1.86	8.52	100
Midi Pyrenees	3.03			0.74	0.81	8.38	4.88	7.20	0.90	0.24	1.27	2.07		100
Nord Pas-de-Calais	15.68		1.71	16.86	7.27	15.44	19.91	0.70	7.55	9.28		1.19	4.41	100
Lower Normandy	18.60			6.30	4.11	39.25	10.26		14.11	3.97			3.39	100
Upper Normandy	0.07	21.05	0.97	0.40	3.39	9.75		5.31	40.83	1.87	0.23		16.14	100
Pays de la Loire	10.81			4.46	7.46	45.29	1.70	1.22		10.67		0.81	17.57	100
Picardy	15.35			7.01	16.01	4.58	17.85	3.24	7.18	5.29		1.57	21.93	100
Poitou Charente	2.80			1.73	3.60	50.04	16.30	3.12	12.43	5.84		2.82	1.34	100
Province, Cote d'Azur and Corsica	2.02	0.55	1.20	1.66	0.44	35.00	11.05	2.36	37.00	1.99	3.74	2.99		100
Rhone Alpes	0.81			7.41	8.31	29.51	17.30	9.00	10.42	7.58	1.25	2.07	6.33	100
France except Ile-de-France	4.53	3.68	1.53	4.81	4.55	22.53	11.53	6.70	27.21	10.09	1.08	1.75		100
France	2.75	4.50	0.99	2.60	2.79	29.57	9.52	7.23	30.21	6.07	1.30	2.46		100

Source: Ministry of Research and Technology, *Atlas régional de la recherche* (Regional Research Atlas)

French Industry R&D Expenditure Reported
92WS0180D Paris INDUSTRIES ET TECHNIQUES
in French 15 Nov 91 p 21

[Article by Andre Larane: "Industrial R&D: Pausing";
 first paragraph is INDUSTRIES ET TECHNIQUES introduction]

[Text] Industrial R&D expenditures are slowing down. The very large companies, feeding on the State's manna, are not affected by the slump.

One hundred and seventy-five companies employing over 2,000 people account for 59 percent of the industrial R&D personnel. These large companies perform 64 percent of the research and receive 81 percent of state financing. These figures, the result of a survey made by

the Ministry of Research and Technology (MRT) based on 1989 statistics, reflect the exceptional integration level of industrial R&D. In 1989, corporate R&D expenditures totaled 86.6 billion francs [Fr]. They accounted for 60.3 percent of the research performed in France (Fr143.6 billion), the remainder being carried out by public organizations and universities.

From 1988 to 1989, R&D Increased by 8.1 Percent by Volume

Public credits representing State orders placed with companies, financed 19.3 percent of the industrial research. Three fourths of these credits came from the Ministry of Defense and were for military and aeronautical research. The State contribution was allocated 49 percent to the aeronautical industry, and 39 percent to the electronics industry. It accounted for 40 percent of the aeronautical R&D budget, and 27 percent of the electronics R&D budget. The State intervention explains the primacy of these sectors when it comes to R&D (see chart [not reproduced]).

The increase in the volume of industrial R&D from 1988 to 1989 was 8.1 percent, i.e., twice that of the gross national product (3.9 percent). This exceptional growth rate was due in part (1.7 percent) to companies that engaged in research for the first time, through the research tax credit. It continued in 1990, since first estimates show a growth of 9 percent by volume, far more than should be expected for 1991 (6.7 percent). The largest companies, it seems, are not affected by the research slowdown. The 1992 civil budget for technological R&D (the BCRD) should not be affected by current economic conditions either, as the minister, Hubert Curien, is planning to earmark Fr51.1 billion, compared with Fr47.7 in 1991 (i.e., a 7-percent increase). The ANVAR (National Agency for the Implementation of Research) will get a boost with a budget of Fr1.14 billion, a 21-percent increase. The space budget (Fr8.6 billion) was increased by 8 percent, and that of the civil aeronautical industry remained at Fr2.3 billion. The CEA [Atomic Energy Commission] will have to make do with the same budget as before (Fr6.2 billion).

France: National Research Network Proposed
92WS0236A Paris AFP SCIENCES in French 5 Dec 91
pp 20, 21

[Article: "Research Computers To Be Connected in National Network by 1995"]

[Text] Paris—With every passing year, informatics plays a bigger role in scientific research: Individual researchers and large research organizations in every sector are using more computers and finding more uses for them, in administration as well as basic and applied research.

Without computers, research becomes impossible; without networks of interconnected computers working faster and faster, the big research programs in nuclear technology,

climatology, physics, chemistry, biology and materials... would not exist or would be severely handicapped.

This was why Mr. Hubert Curien in his 4 December message to the Council of Ministers underlined the importance of a 1991 initiative in this area that has involved civilian research program authorizations amounting to more than 700 million French francs [Fr] and total outlays of more than Fr1 billion (taking personnel costs into account).

All types of computers, from micros to supercomputers, are used in French research programs. A microcomputer in a research facility is typically used by five laboratory researchers, costs on the order of Fr0.15 million per year, and must be replaced every four years.

Departmental mainframes, which cost Fr0.7 million per year and may be used by groups of about 20 researchers, must be replaced about as frequently. The computer centers [CDC's], which can accommodate 1-2,000 users, cost Fr70 million per year; fortunately, however, their equipment does not have to be replaced so often.

Another indication of the importance of computers in research: According to estimates from the [research] ministry, data processing expenses average out (depending on the accounting method used to figure them) to between Fr25-60,000 per user per year.

Big research organizations like the National Institute for Research on Data Processing and Automation (INRIA), the Atomic Energy Commission (CEA), and the National Scientific Research Center (CNRS) have diverse data processing needs; as a consequence, they use different approaches and require different system architectures.

Real-time computing is vital for operating experimental nuclear reactors such as Tore-Supra, the Cadarache fusion research machine, and particle accelerators like the Large Heavy-Ion Accelerator (GANIL) at Caen.

Simulations used in studies in the fields of aerodynamics (space, aviation), climatology, oceanology, meteorology, biology and geophysics require the resources of big CDC's equipped with the Cray-II or a "Connection Machine," with its massively parallel architecture in which the equivalent of hundreds or even thousands of microcomputers work together to solve a problem faster.

Some large CDC's serve users on a regional or even nationwide basis, and in light of the high cost of cutting-edge data processing equipment, civilian and military researchers are forced to share computer time.

In an effort to further optimize and rationalize the use of these computer resources—and facilitate nationwide and international utilization through collaboration between research teams—the Ministry of Research has decided, in cooperation with the Ministry of National Education, to accelerate the implementation of Project RENATER (National Telecommunications Network for Research).

The project's aim is to offer research teams in academia, technology and industry an advanced electronic message service and a communications infrastructure comparable to what is available to their foreign counterparts.

RENATER is therefore going to link existing regional networks into a national information grid that can transmit data at a rate of 100 to 140 megabits per second and interface with European and American networks. France Telecom will participate in construction of the network in the coming months. Some 50 sites will be linked up by the end of 1992; later on, the number will grow to about 100, and 3000 to 400 sites will be connected by 1995. As it grows, RENATER will also clearly have to keep in step with changing needs and technologies.

Report Assesses FRG Research Policy, Economic Results

92WS0264A Duesseldorf *HANDELSBLATT* in German
31 Dec 91 p 45

[Article by Waldemar Schaefer: "Research in Europe: EC Member States' Financial Capabilities Are Very Different; Federal Republic of Germany Is Still Well in the Running in Worldwide Technology Competition"]

[Text] [Passage omitted] In a "Report on the Federal Republic of Germany's Competitiveness in Technology" submitted on 10 December 1991, the Ministry for Research and Technology attempts to explain the relationship between research and development, on the one hand, and successful exports and job security, on the other.

Moreover, the Ministry of Research bases itself on the fact that, with 17.4 percent, the Federal Republic of Germany had the largest share of the world trade in processed industrial products in 1989 (that is, still without the new federal states). But, with 14 percent, it lagged behind the United States in the field of "high tech" and behind Japan in "higher technology" with 21.6 percent.

The Ministry of Research designates as high tech (in accordance with the Fraunhofer Institute for System Technology and Innovative Research's definition) a field in which at least 8 percent of the business turnover is spent on research and development. Expenditures between 3.5 and 8.5 percent are devoted to research and development in the field of higher technology.

Of importance to the Ministry of Research is the realization that both fields described as "R&D-intensive branches of industry account for a decisive portion of the expansion in employment that has been going on since 1984." More than 400,000 jobs were created here between 1984 and 1990. More than 3.2 million workers have been employed in the technology-intensive branches, that is, 45 percent (still 40 percent in 1978) of those employed in industry.

Nearly 90 percent of the new jobs were created in "higher technology" in the fields of instrument and precision-tool making, agricultural technology, electro-technology, the auto industry, telecommunications, measurement and adjustment technology, and chemistry. High tech proper—which is, of course, also to be found in the above-mentioned fields—suffered from the less satisfactory development of German data-processing technology.

For the future, the Ministry of Research expects that the positive trend in employment in the field of technology will for a short time be overlapped by special developments in connection with reunification. By way of example, by a greater demand for consumer goods than for capital goods. It is, of course, not to be expected that this will produce a permanent overlapping of the long-term trend. The "dynamics of research in the German economy" is of value as an important basis for successful research in German industry—success that is also striking in [the number of] foreign patents. This dynamics is reflected in the government's relatively small outlay for research and is only surpassed by Japan.

So, it is no wonder that Minister of Research Dr. Heinz Riesenhuber will in future bet on private-sector research in particular, does not want to interfere with it either, and emphatically rejects demands for an industrial policy, demands that are being repeatedly heard.

But the question for the future will be whether the EC on the whole behaves in similar fashion and whether the industrial policy that is already pursued in some countries should not be institutionalized Community-wide, especially in the domain of research. With big pots of money—so far the Community has made available only about 3.3 billion German marks a year within the framework of its general research program—industry could be thoroughly induced to accept the exercise of influence by European officials.

It is to be feared that the consequences would be negative. For one thing, national and supranational administrations are much too far removed from the market to really be able to know in which direction applied research and development have to go to be successful. For another, state research subsidies—whether in Germany or at the EC level—are already so complicated that only companies with appropriate staff departments benefit from the money; many medium-sized companies, on the other hand, frustrated after their initial experiences with the bureaucrats, give up any claim to public funds. But above all, the goal cannot be research subsidies for the big companies.

The European Commission will also have to concentrate on basic research in particular. Moreover, it must stand up for general provisions that favor research and contribute to rapid transfer of technology.

With respect to funding, private-sector research and development should also be left largely or entirely to the companies. Not finally, because then other countries

could, in connection with GATT negotiations, criticize us for deliberately contributing to the distortion of competition through research subsidies to the disadvantage of others.

Reorganization of East German Research Network
*92WS0211A Stuttgart BILD DER WISSENSCHAFT
in German Dec 91 pp 16-20*

[Article by Barbara Bachtler: "Rebuilding the Research Landscape: GDR Science Undergoing Overhaul"]

[Text] Science in the former GDR is undergoing a general overhaul. The Science Council finally completed its evaluation in October. It recommends that only half the number of researchers be retained in the more than 60 new research institutes. The research community in the former GDR will receive a completely new countenance in the coming years.

An entirely new science landscape is now being cultivated in the five new Federal States. Excluding the universities, the old centralized scientific network, with its various academies subordinate to the Academy of Sciences, ceases to exist on 31 December 1991, according to the Unification Treaty.

December 31, 1991 marked the finish of the Academy of Sciences of the former GDR. The employment contracts of academy associates expired on this date, as did the 15-month transition financing by the Federal Government. The Unification Treaty established all of that.

The Science Council, a consultative body, which, besides scientists, counts Federal and State politicians as well as representatives from industry and the unions among its members, was charged last July to evaluate all research facilities, especially those associated with the GDR Academy of Sciences. The Science Council was to "evaluate" what could "be incorporated" in the federally restructured science community of the old Federal Republic, and what could not be. The evaluations for most of the institutions were ready by mid-July.

The recommendations of the Science Council for restructuring the research community of the former GDR weigh heavily—literally. The almost 2,000 pages of its report weighs close to 2,500 grams on the scale. The report, presented in October, seals the fate of the GDR Academy of Sciences, together with its 67 institutes; the Structural Engineering Academy with its 20 institutes; and the Academy of Agricultural Sciences, with its 47 institutes. In all, the roughly 200 specialists of the Science Council, divided into 20 work teams, evaluated some 130 nonuniversity-affiliated research establishments in East Germany.

The Science Council also closely scrutinized a total of 54 GDR higher schools, including six universities, 12 technical colleges, and 257 advanced professional schools—all of which were subordinate to the individual States.

The maps on the two preceding pages [see original article] show how the new set-up will appear. The strong points of the new research community are notably in the natural sciences. According to Wilhelm Krull, spokesman of the Science Council, about 60 percent of the positions in the earth and space sciences, as well as environmental sciences, will be retained. On the other hand, strength in biology and biomedicine will be sharply reduced. A quota of 30 to 40 percent has been cited. Up to 50 percent of the positions in the agricultural sciences, which were very highly regarded in the former workers and peasants state, will be eliminated. Surprisingly, about 50 percent of scientists in the humanities will have the opportunity to retain their positions. It was precisely in the fields furthest removed from politics, like ethnology and archeology in Central Asia, Albanian studies, ancient history, general linguistics, and music, that the former GDR made internationally recognized contributions. In the field of economics only about 25 percent will be carried over, and in jurisprudence, a scant 10 percent.

The initial fear that the elimination of the GDR academies would at the same time discredit the work of GDR scientists has been dispelled. It has become clear that, despite many prejudices in West Germany, the former GDR was in no way a "scientific desert." GDR research even had several scientific stars, who held their own in the international scene. Some indeed were unique. And that was accomplished despite the massive obstacles placed before researchers by the rigid, suspicious East German police state.

The three central institutes for molecular biology, heart-and-circulatory research, and cancer research in Berlin-Buch were among the most renowned centers. Of invaluable worth to science are the GDR Cancer Register (see, "Protection of German Data Impedes Cancer Research" in *bild der wissenschaft*, 11/1991) and the Central Register for Diabetes. Each of these medical data banks monitored 16.6 million citizens. These registers are, in fact, the largest population-based cancer and diabetes information banks in the world.

The Cancer Register contains data on about 2.2 million patients. It contains information on survival rates, environment and cancer, tumors in children, and the frequency of cancer recurrences. The Cancer Register was founded in 1953 at the Charite Hospital in Berlin in 1953, when it became obligatory to report tumor occurrences.

The Diabetes Register at the "Gerhardt Katsch" Central Institute for Diabetes in Karlsburg near Greifswald has been in existence since 1960. It contains the most complete data on the frequency of occurrence and pathological history of diabetes in the world.

Epidemiologists from West Germany would like to have access to these studies as soon as possible. But those charged with protecting the data have set up a legal obstacle. It appears that this personal medical data on

GDR patients had been collected with the individuals involved not having been informed about it. That East German procedure of failing to inform the individuals involved violates West German jurisprudence. However, the Federal Government and the States are now in the process of devising regulations that would permit the future use of the registers.

The Science Council has also confirmed that the highest scientific standards had been practiced in the Central Institute for Genetics and Cultivated Plant Research in Gatersleben. This institute in the foothills of the Harz Mountains lies in very favorable climate, which traditionally had been a center of plant cultivation. Internationally recognized, above all, are that institute's works on gene transfer and gene expression, as well as research on virus infections in cultivated plants.

In addition, the institute has a gene bank containing about 69,000 different cultivated plant types from the temperate climatic zones as well as their wild varieties. So impressive this, that it is currently being considered whether the gene bank in the West German Research Facility for Agriculture in Braunschweig ought not be transferred to Gatersleben. The institute itself will—on the recommendation of the Science Council—continue as a "blue-list" institute.

"Blue-list" institutes are so named because the West German agreement for the establishment of such facilities, which are half financed by the Federal Government and half by the host State, was printed on blue paper. Since financial support in the new Federal States is very limited, the Federal Government—under the provisions of the university renewal program—will assume about 20 percent of the State contribution for the next two years, commencing in January 1992.

The Research Center for Chemical Toxicology in Leipzig is considered unique in all of Germany. The approximately 70 researchers in this center are experts in the analysis and elimination of harmful substances, especially poisons and chemical agents. "Unconditionally worth retaining in its full operation," reads the evaluation of the Science Council. The Council recommends that this institute be incorporated in the planned major research center for environmental studies to be established in the area around Leipzig/Halle. The expertise of these scientists will not only be indispensable for the elimination of the "residual contaminants of military origin," left behind by the Soviet Army, but will be of great use in the West as well.

In place of the academy institutes, the Science Council recommends that the following facilities be established:

Blue-List Institutes

Exactly 33 institutes with almost 4,400 positions, including 500 positions alone for the former GDR nuclear research center at Rossendorf. Also, incorporation of seven research fields in already existing institutions in West Germany and Berlin.

Major Research Facilities

In all, three major research facilities are to be established in former East Germany. They will be 90 percent-financed by the Federal Government and 10 percent-financed by the host State. They are:

- Biomedical Research Center in Berlin-Buch,
- Research Center for Continental Lithosphere Studies in Potsdam,
- Research Facility for Environmental Research in Leipzig/Halle.

In addition, branch offices will be incorporated or established in already existing major research facilities in West Germany. Thus, for example, the Research Center for Photochemistry and Photophysics in Berlin-Adlershof will be combined with the Hahn-Meitner Institute in the western part of the city, and the Institute of High-Energy Physics in Zeuthen could become a branch of the German Electron Synchrotron (DESY) in Hamburg.

Max Planck Society

Two institutes (a Max Planck Institute for Colloid Chemistry and Interface Research in Berlin-Adlershof, and a Max Planck Institute of Solid-State Physics and Electron Microscopy in Halle), several project groups, and a branch office. Seven additional humanities centers with a total of 800 positions. In addition, up to 25 work groups will be assigned to universities.

Fraunhofer Society

Eight institutes and ten branches with a total of a thousand positions.

Federal Government Research Projects

Two Federal research facilities with over 400 positions (one in Quedlinburg for Plant Cultivation, the other in Jena for Animal Epidemic Research) as well as seven different research projects with 400 positions.

State Research Projects

Fifteen different research projects with roughly a thousand positions, including the Physical-Technical Institute in Jena.

On the recommendations of the Science Council, the new higher school community will have the following structure:

Universities

About 12 to 15 universities and technical colleges.

Advanced Professional Schools

About 20 advanced professional schools with about 52,000 students.

Of the roughly 30,000 scientists and others, who were employed by the Academy of Sciences, the Structural Engineering Academy, and the Academy of Agricultural Sciences, only about half have a chance of being retained. Excluding the universities, the Science Council estimates that 11,100 positions will be created. Another 2,000 positions are to be established in higher schools for former academy associates. This plan is not without a certain irony in that many who found the imposed political machinations in the higher schools unacceptable, had earlier fled to the academy. "They will hardly be welcomed back to the higher schools with open arms," Professor Dieter Simon, chairman of the Science Council, fears.

Not taken into account in this evaluation are the roughly 80,000 positions in industrial research facilities. They fall under the responsibility of the Trust.

No substitute positions, especially for the elderly, have been planned. It will hit those in the 45- to 60-year-age bracket hardest, who, according to Simon, "have been systematically deceived as to their chances of survival," and who do not fit into the plan as currently conceived. Simon: "The tragedy is just beginning." Simon admits that he is not indifferent to the fate of those passed by. Consequently, the Science Council had made an appeal to create positions and opportunities for work for the older scientists.

From the onset of the evaluation, the Science Council was under enormous time pressure. The evaluators rushed through their sifting of the institutes. This in itself evoked strong criticism (see, "Betrayed and Sold," in *bild der wissenschaft*, 5/1991). Thus, Harry Meier, formerly of the Academy of Sciences and resident of West Germany since 1986, spoke of a "merciless steamroller," flattening the institutes. Jens Reich, scientist and cofounder of the New Forum, complains that the Science Council had only "one minute and half a line to decide the fate of each researcher." In retrospect, Simon says: "If then—over 12 months ago—it was viewed as a success that the Federal Government declared itself willing to finance the research facilities for another year, it quickly became manifestly clear that the time frame for the evaluation was far too short. Considering the dislocations involved, that was a bad mistake. We should have had two years to work it out."

But the time pressure has not relented. Even for the roughly 2,000, who are to be incorporated in the higher schools, only the "pitiful two years" of financial support is available, Simon complains. The Science Council had backed a transition period of five years.

Simon notes further that the fact that "we knew much too little about the research system" made the evaluation of the institutions particularly difficult. Applied research had always been emphasized in the former GDR; it will now be even more highly regarded in the new Federal States, given the strong backing of the Fraunhofer institutes. The universities and advanced professional

schools offered career-oriented programs. In its report, the Science Council, among other things, asks that engineer and professional school graduates not be rejected out of hand because of the lack of "formal" qualifications, but rather that the professional quality and performance of each be considered.

The Federal Government and the States are now working to have the recommendations of the Science Council put into effect as rapidly as possible. Berlin and the new States have arranged with the Ministry of Research in Bonn to establish the Coordination and Settlement Office for the Institutes of the Academy of Sciences (KAIAdW) in the future capital. Several founding committees for institutes have already begun their work. In November the Federal Government-States Commission met to decide upon the budgets for the jointly financed research facilities. Simon believes that "the Government's role should not be optimized." He regrets, however, that—on the purely human side—there has been a lack of patience, good will, and readiness to share.

Simon is convinced that in evaluating only East German facilities, the "opportunity had been missed" to review critically the entire German research community. In 1990, the Science Council in its "Twelve Recommendations" had brought attention to the fact that it considered a thorough reform of the entire German research community to be essential. Even if at this moment the politicians apparently do not see a need to tackle that question, an evaluation of research in West Germany will eventually be unavoidable, in Simon's opinion, because the days of overflowing cash registers are already a thing of the past. Bonn hopes to pump about six billion German marks [DM] into research in the new States by 1995. If done, it can hardly be without repercussions in West Germany. The large research establishments, especially, fear financial cuts in their budgets of up to 30 percent. A first beginning in evaluating research in West Germany has indeed already been made. The Science Council has issued a statement on the state and prospects of environmental research throughout all of Germany for 1992—a step that the Federal Ministry of Research has approved.

The evaluation of the GDR institutions is only the beginning of a very painful process. A crucial test will be in filling the new positions, particularly the leadership positions. At that time, the individual applicants will be "evaluated," weighed, and found, perhaps, to be too light professionally or too heavily burdened with a political past. The individual human tragedies are just beginning.

Science Council

The Science Council was founded in 1957 by the Federal Government and the States. The seat of the Council is Berlin; its business office is in Cologne. The Science Council has been charged with the responsibility of making recommendations on the development of higher

education, to take a position on questions of research and science, and to provide reports at the request of the Federal Government, the States, or the Federal Government-States Commission. The Science Council is divided into the following bodies:

Scientific Committee

For the past year it has had eight new members (previously it had 22), bringing its total membership to 30. Two appointments remain open. The members, scientists, and representative from public life are appointed by the President of the Republic.

Administrative Commission

The commission has 22 members, without the new States it had been 17. The Federal Government sends six representatives, and each of the States sends one, bringing the total to 16. The Administrative Commission has 32 votes. (The representatives of the Federal Government have as many votes as the States.)

General Assembly

The Assembly has 54 members now, as against 39 previously. The General Assembly decides on the resolutions of the Science Council. A two-thirds majority is required.

The chairman of the Science Council is Professor Dieter Simon, Director of the Max Planck Institute for European Legal History and Department Head for Civil Law and Roman Law at Frankfurt University.

Box, p 20

Map [not reproduced] indicates the locations of the former institutes of the now extinct GDR Academy of Sciences as well as the sites of the universities in the former 15 administrative districts.

Box, p 20

The Proposed New Science Structure

Map [nor reproduced] depicts the new breakdown into the five new Federal States and Berlin), again excluding the universities, has been based on the recommendations of the Science Council. The council was commissioned in July 1990 by Bonn, the old FRG and the then extant GDR, to "evaluate" just what could "be incorporated" in the federally reunited research community of the old Federal Republic and what not. The council recommended the establishment of more than 60 new research institutes, including three major research establishments, two Max Planck institutes, and more than 30 "blue-list" institutes, which are financed jointly by the Federal Government and the host States. In addition, it recommended the establishment of about 15 universities and technical colleges as well as 20 advanced professional schools.

Eastern German Physics Institute Becomes DESY Branch

92M10173 Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN* in German
14 Nov 91 pp 8-9

[Text] The signing of the new DESY [German Electron Synchrotron] convention between the Federal Minister of Research and Technology (BMFT), the Free Hanseatic City of Hamburg, and the Land of Brandenburg, sees the foundation on 1 January 92 of a new DESY branch in Zeuthen, Brandenburg, the successor to the Institute of High-Energy Physics (IfH) of the former Academy of Sciences (AdW).

The Hamburg-based German Electron Synchrotron is a major research facility that uses high-energy accelerators to research fundamental questions of the structure of matter and the microcosm in a context of international cooperation.

The IfH was one of the first institutes on whose development the Science Council, in collaboration with a British scientist, made a recommendation back in January 1991 as part of its evaluation of AdW institutes. The Council expressed its recognition of the high scientific level of the Zeuthen institute and recommended that it be preserved as part of DESY. The institute was successfully engaged in international cooperation in this field of research and for many years participated in the large-scale high-energy physics projects at CERN [European Nuclear Research Center] in Geneva, DESY in Hamburg, and at the research centers in the Soviet Union. It is remarkable that the IfH was the only AdW institute in the former GDR to be able to engage solely in basic research aimed at acquiring new knowledge.

DESY-Zeuthen will have 136 established posts; of the Ifh's 220 former employees, 131 will find new jobs at DESY-Zeuthen. The budget for 1992 amounts to about 19.3 million German marks, 90 percent from the BMFT and 10 percent from the Land of Brandenburg. This will enable the Zeuthen institute to continue its participation in current major high-energy physics experiments in the future as well. The institute will also be able to develop a scientifically attractive program of its own. It will take part primarily in the experiments with HERA [hadron-electron ring accelerator] at DESY in Hamburg. International cooperation on projects at CERN and with the Soviet Union will also be pursued, e.g., research into cosmic radiation particles (neutrinos) in an underwater telescope in Lake Baikal, Siberia.

The presence of British Education and Science Secretary Kenneth Clarke at the signing of the convention underlines our European neighbors' interest in working with research institutes in the new laender and in the plans for shaping a new, pan-German research scene. British scientists took a leading role in planning and building the detectors for the H1 and Zeus experiments in the HERA storage ring at DESY in Hamburg and will play an important part in evaluating the measurements.

Secretary Clarke also visited the Institute of Gene Biology Research in Berlin, whose work serves both to enhance the structure of basic research and to promote technology transfer in biotechnology.

Italy: 1990-91 Participation in EUREKA Reported

Projects, Investments

92MI0119 *Turin MEDIA DUEMILA* in Italian Oct 91
pp 33-35

[Text] The 121 new EUREKA [European Research Coordination Agency] projects approved at the Hague conference bring the total to 490, with 12.3 trillion lire in funding. Twenty-nine of the 121 new projects, valued at 286 billion lire are 45 percent funded by Italy. Italy is a reference point for 18 of these 29 projects (see box inserts on some of the principal biotechnology and environmental projects.)

After the Hague conference, Italy's participation in EUREKA amounts to 163 projects with a financial contribution of over 2 trillion lire, that is 16 percent of the total. Sources at the Ministry of Research point to the increasing participation of small and medium-sized industries, primarily those located in central and northern Italy, alongside the prevailing participation of large-scale industries.

Attention to environmental problems, which marked the Italian presidency of EUREKA up to June 1990, has continued under the Dutch presidency. In particular Italy has announced eight new environmental projects that focus on developing remote sensing and monitoring systems for the marine environment and "clean" manufacturing technologies.

In the field of new materials, the EU 558 MOSAIC (Material Optimization for Structural Automotive Innovative Concept) project, which sees Italy participating with France, the Netherlands, Norway, and Switzerland, is of particular interest. The project involves developing new manufacturing techniques for automobiles using innovative materials such as polymer composites and light alloys.

In the same area, Geaf, a small company from central Italy, is participating in the EU 541 POLYWELD project together with the University of Bologna and a Dutch company for the development of a thermal contact welding system.

In the computer field, Olivetti group companies are taking part in the EU 604 REM project together with the Spanish company Tectel for the development and application of methods, techniques, and tools for "reverse engineering," maintenance process management, and software lifetimes.

In the laser area, Italy is participating in the EU 643 "Eurolaser Safety in the Industrial Application of Lasers" project with top level companies such as Fiat,

Comau, and CISE [Center for Data, Studies, and Experimentation]. The project, which sees the collaboration of companies from Germany, France, and other countries, aims at improving safety against direct and secondary radiations from materials treated by lasers or generated by chemical reaction.

[Box Insert]

EU 475 BASSGROWTH PROJECT

Area: Biotechnology. **Title:** Hormone production for genetically engineered fish breeding.

Italy is participating in the project with Polymed S.r.l. [limited liability partnership], a company based in Florence, which is the project leader, together with the Institute of Endocrinology and Pathology of the University of Florence. The Spanish company LPL Sa of Barcellona is also a partner. The project is expected to cost 4 million European currency units [ECU] overall with Italy paying 62.5 percent of the total and Spain 37.5 percent, and will last about three years.

The goals of the project are: to produce the growth hormone of sea bass using recombinant DNA technology. Given the widespread presence of this species in fish farms and its subsequent economic importance at international level, the hormone would be used to obtain a significant improvement in the weight/quality of the species. The administration of this hormone poses no problems because it is limited to young subjects over a short period of time. Furthermore, once placed in the tank water it is absorbed through the fish's gills with no degradation along the digestive tract. The preparation of this hormone in fish farms, which is produced by the pituitary gland in small amounts, can be very complex and costly, and accordingly yield poor results. Larger quantities of hormones can be extracted using recombinant DNA technology, which is the cheapest and safest approach, since it has already been tested in mammals including man. The project proponents estimate that the growth hormone may result in a 40 percent energy reduction expressed as the increase in weight of treated subjects.

[Box Insert]

EU 633 PROPLANT PROJECT

Area: Biotechnology. **Title:** HGH (Human growth hormone) production in plants using recombinant DNA technology.

Italy is participating in the project with the C. Serono S.p.A. pharmaceutical company and Serono Sud both located in Rome. Plant Genetic System N.V. in Ghent (Belgium) is the partner. The project is expected to cost ECU46 million overall, 67.4 percent funded by Italy, and 32.6 percent by Belgium.

The duration of the entire (R&D) phase is about 10 years.

- The objectives of the project are:
- The study and development of innovative technology for HGH production in an extensively cultivated plant, the "Brassica napus." The raw material from the plants will undergo the most sophisticated extraction and purification techniques to obtain a pure and therapeutically more reliable hormone than the similar hormones currently found in various pharmaceuticals on the market and extracted from natural sources (pituitary extracts) or with bioengineering techniques using mammal cells, yeasts, or bacteria.
- The study of HGH drugs that increase the bioavailability [biodisponibilita] of active ingredients and accordingly promote the use of new and more targeted clinical strategies in the treatment of diseases related to HGH deficiency. In addition to traditional intravenous preparations, research will center on pharmaceuticals in which the active ingredient is encapsulated in microspheres (suspensions, capsules, tablets, etc.) and microencapsulated slow-release intravenous drugs.

[Box Insert]

EU 179 ISMAP PROJECT

Area: The environment. **Title:** Automated information systems to analyze and monitor the pollution of watersheds caused by chemicals used in agriculture and animal husbandry.

Italy is participating with Aitec S.p.A. of Milan, the project leader, Fer.Tec of Ravenna (both part of the Ferruzzi group). The French partners are: General Water

Company (Paris), French Hydraulics Laboratory (Grenoble), Ciba-Geigy (Rueil-Malmaison), Rhone-Poulenc (Lyons), Societe chimique de la grande paroisse (Paris), Cemagref (Paris), and Water Agencies. The project is expected to cost MECU 21.36 overall, 51.5 percent funded by Italy and 48.5 percent by France, and will last about four years.

The goals of the project are to make a basic methodological and technological contribution to the management and protection of water resources by developing:

- Operational definition and analysis methods to better manage pollution caused by agricultural activities at watersheds, subbasins, or local areas;
- A computerized decision-support system for water resources (ISMAP system) built up using currently available and adequately integrated models, data bases, know-how, and computer systems;
- New methods to identify and measure the levels of water pollutants;
- Optimizing the treatment of polluted water intended for human consumption.

In order to attain these objectives, the ISMAP project must group together companies producing chemicals for agriculture and animal husbandry water authorities and concerns, representatives from the farming community, scientific bodies, and the developers of operational systems, to create the multidisciplinary synergy that is needed to solve most environmental problems. ISMAP's goal is to become a reference tool at the European level and to contribute to the preparation and certification of national and EC regulations in its fields of activity.

Italian participation in new projects (costs in billions of lire)

Area	Projects	Title	Total cost	Italy's share
Environment	EU 354	EUROENVIRON-FID	2.8	1.0
	EU 471	ENVINET-ALAMOS	5.5	3.0
	EU 478	EUROENVIRON-CRO	7.5	5.3
	EU 479	EUROENVIRON-ISM	32.1	16.5
	EU 508	ENVINET-SIQWAM	5.3	3.7
	EU 540	ENVINET-ATAC	11.8	8.7
	EU 628	EUROMAR-ECHOSEA	3.8	1.6
Biology	EU 655	E3 TANKER	3.9	.8
	EU 475	BASSGROWTH	6.0	3.8
	EU 566	LMWH:LOW MOLEC	1.8	.9
	EU 569	PARTIPRO	135.0	67.5
Energy	EU 617	IMMUNOSCREEN	10.8	5.4
	EU 633	PROPLANT	69.0	46.5
	EU 666	INCA	32.4	17.4
	EU 625	VADIS	30.1	3.0
Computer Science	EU 636	EUROPICON	16.9	4.2
	EU 604	REM	28.2	21.6
	EU 642	STILMED	10.8	8.1

Italian participation in new projects (costs in billions of lire) (Continued)

Area	Projects	Title	Total cost	Italy's share
Materials	EU 643	EUROLASER-SAFET	31.6	7.5
	EU 541	POLYWELD	7.5	5.3
	EU 558	MOSAIC	76.8	9.8
	EU 613	CUSOFT	.8	.1
Robotics	EU 616	EURO RIM	14.4	2.1
	EU 627	SUM-PROJECT	1.9	1.0
	EU 474	FIRST-FRIENDLY	37.6	20.5
	EU 482	SP 80	8.3	6.0
Telecommunications	EU 554	DIECONT	5.3	1.6
	EU 668	FAMOS-EFFORT	18.0	6.0
	EU 527	LOCSTAR-LOCSET	19.5	7.4
Total			635.5	286.4

Audiovisual Presidency

92MI0119 *Turin MEDIA DUEMILA in Italian Oct 91*
pp 36-37

Interview with Giovanni Castellaneta, second class minister plenipotentiary, head of the press and information service of the Italian Ministry of Foreign Affairs, by Giampiero Gramaglia of MEDIA DUEMILA; place not specified: "Italy and the Audiovisual Program"; first two paragraphs are MEDIA DUEMILA introduction]

[Text] Since 1989, Giovanni Castellaneta, second class minister plenipotentiary, head of the press and information service of the Ministry of Foreign Affairs has been Italy's coordinator for the EUREKA [European Research Coordination Agency] audiovisual program. From 30 June 1990 to 1 July 1991, he was chairman of the committee of national coordinators, the most authoritative body of the European program.

Born in Gravina, Puglia (province of Bari) in 1942, Castellaneta graduated from the University of Rome in 1965, with a degree in law, and began his diplomatic career in 1969. Among his assignments abroad, Castellaneta was with the Embassy of Italy in Lisbon, where he was in charge of press relations during the "revolution of the carnations," and at the Italian Embassy in Paris where he was press and information advisor. In Rome, Castellaneta was a close collaborator of Bettino Craxi when the latter held the presidency of the Council of Ministers and was also diplomatic advisor of the Ministry of the Treasury.

MEDIA DUEMILA: What were the most important results achieved by the EUREKA audiovisual program during Italy's year of chairmanship?

Castellaneta: When we took over the chairmanship the program had just begun, its structures were still uncertain, and many had doubts as to its ability to survive. During Italy's year as chairman we can say that the EUREKA audiovisual program became a fully mature

initiative. During this period, in fact, the structures, that previously existed only on paper became operational. I am referring to: the Secretariat of Brussels, a reference point as well as an instrument to gather and disseminate information for a program that brings together 29 European countries as well as the EC Commission and the General Secretariat of the Council of Europe; the network of national coordinators, one for each member country (the national coordinator is the interface between the program and the national operators as well as the authorities that decide whether or not to approve projects); and the Audiovisual Observatory, whose task is to monitor the evolution of the audiovisual sector in Europe and identify future potential developments.

Another important result was increased synergies between the various European initiatives in the audiovisual sector. I am referring to Euroimages, the Council of Europe's program, and above all, to the EC's program, MEDIA [Measures to Promote the Development of the Audiovisual Production Industry]. We were particularly effective in the latter case, since EC negotiations on the adoption of MEDIA were conducted entirely during our chairmanship, precisely when we had just taken over the EUREKA position. The result appears evident when examining the EC Commission's participation in the various EUREKA projects, particularly the most significant.

Two key elements demonstrate that the EUREKA audiovisual program has been fully launched. First, the number of projects, which during Italy's year of chairmanship increased from three to almost 30, while more than 60 proposals are still under study. This means that the operators are responding well and have a real interest in participating. The other element is the fact that the request of three eastern European countries, Czechoslovakia, Bulgaria, and Romania, to be included among the members of the program, has been successful. This is proof of the attraction that the initiative exerts not only on operators, but also on governments.

MEDIA DUEMILA: What has been the participation of governments, industry, and audiovisual professionals to date?

Castellaneta: As I was saying, the participation of industry and of professionals in the sector is, in my opinion, good, and I say this in light of both the projects already approved and those being evaluated. In addition to the small to medium operators, the large audiovisual industrial corporations also are interested in EUREKA. It is no chance that the idea of creating a chain for the dissemination of a television news bulletin in Europe was presented as a EUREKA project. I am speaking of the well-known EURONEWS project.

Government participation is also good. Proof of this is the request from the three countries I referred to earlier. The political value of the EUREKA audiovisual program does not escape notice; an operational organization open to all European countries in a sector in which the contribution of eastern European countries can be very significant.

Instead the resources that individual governments have earmarked to support the program are unsatisfactory. With the exception of Italy, very few countries have provided for funds or taken specific measures to support the projects that are recognized as EUREKA projects. These countries therefore, must either use their own resources or try to obtain other sources of funding. Since we were aware of this state of affairs, we requested the EUREKA Secretariat to make the most wide-ranging survey possible of all the European sources of funding that EUREKA projects might have access to. However, as with the EUREKA technology program, the member countries must mobilize the resources that can effectively support projects once they are approved.

MEDIA DUEMILA: How is the response from the public and private sector in Italy?

Castellaneta: In Italy the response of operators has also been excellent. Half of the approved projects include Italian participation and there are great hopes for EUREKA. In the audiovisual field, Italy has extremely high capabilities and therefore has a great deal to offer. EUREKA with the freedom of action it gives to operators and its flexible structures, is an ideal context for launching new projects. Nevertheless, Italy still lacks the resources required to effectively support projects once approved. Measures should be enacted to create a EUREKA trademark that is something more than a symbol of quality.

The situation is brighter with regard to structures. Italy is in the forefront in this area because a single structure coordinates its participation in all audiovisual projects at the international level. The advantages in terms of streamlining activities and synergies are evident.

MEDIA DUEMILA: Has EUREKA's audiovisual program succeeded in improving competition in the sector between Europe, Japan, and the United States over the

past two years? Or has it not yet made its influence felt on the market in a significant way? And if so, when will this be possible?

Castellaneta: I do not believe that relations in this sector between Europe, the United States, and Japan should be viewed in terms of hostile competition. Rather, we must approach these other two major players in terms of equal cooperation because each of these three important areas has something to offer and to receive. The EUREKA audiovisual program, through its formula of cooperation among operators from the member states, is striving to develop European potential to the utmost, a potential that would be otherwise fragmented by many small markets.

MEDIA DUEMILA: The EUREKA audiovisual program has already been able to associate several eastern European countries. What indications emerged in this sense from the seminar in Trieste and what are the future plans?

Castellaneta: The eastern European countries, as I was saying, are extremely interested in the EUREKA audiovisual program. They have great potential in this sector. Consider the capabilities of the Soviet cinema, the know-how in the sector of cartoons in countries such as Hungary or Czechoslovakia, not to mention the works of Zanussi. One of the aces of Italy's chairmanship was to increase the concrete participation of these countries in EUREKA to the maximum. Consequently, we instructed the secretariat to contact the authorities at PHARE [Poland-Hungary: Assistance To Restructure the Economy], the program supporting cooperation with the eastern European, as well as with the European Bank of Reconstruction and Development in London created specifically to finance major reconstruction projects in the East. In fact, the main problem is that these countries, while living a moment of great ferment, are experiencing an extremely serious economic crisis which has a decisive impact on their ability to take an active part in the program. This leads to the need to find the means to actively support them otherwise, their participation will be only marginal and an important economic and political opportunity will be lost. We must not forget that these countries constitute a major market for audiovisual products that appeal to many.

CORPORATE ALLIANCES

EC Authorizes Thomson-CSF/Pilkington Optronics Joint Venture

92WS0167B Brussels EUROPE in English
26 Oct 91 p 10

[Article: "(EU) EC/Competition: The Commission Authorizes the Merger Between Thomson-CSF and Pilkington in the Field of Optronics (Defence)"]

[Text] Brussels, 25/10/1991 (AGENCE EUROPE)—Pursuant to the EC regulation on preliminary control of European-scale mergers, the Commission has authorized

the creation by Thomson-CSF and Pilkington PLC of a concentrative joint venture in the field of optronics (electro-optical applications used primarily in military applications). Thomson-CSF will acquire through its British subsidiary (Thomson UK) 49.99% of the shares in Pilkington Optronics, a Pilkington group subsidiary active in this field. The Commission's analysis shows that the present operation will neither create nor strengthen a dominant position which significantly impedes competition because:

1. The parties operate in different national markets. The geographical market defined (including the principal NATO countries) remains very closed at the national level, because the only buyers are national defence ministries and their local suppliers. This could change in the future, given the opening up of public procurement procedures, but such a change has so far proved very limited.

2. The market for the products in question consists in fact of several markets which include various systems (warning, detection, identification, navigation and fire control) and platforms (aircraft, helicopters, missiles, ground vehicles, submarines, etc.). The products manufactured by Pilkington Optronics and Thomson-CSF are to a large extent complementary and there is very little overlap. There are also other strong competitors on the different markets.

This merger is the second authorized by the Commission in the field of defence, the first being the Aerospatiale-MBB merger in the field of helicopters.

Aerospatiale, MBB Merge Helicopter Divisions

92WS0261A Paris *LE MONDE* in French 22-23 Dec 91
p 17

[Article: "Aerospatiale and MBB Announce Merger of Their Helicopter Divisions"]

[Text] On 18 December, the French group Aerospatiale and the German company MBB (Messerschmitt-Boelkow-Blohm), a subsidiary of the Deutsche Aerospace (DASA) group, officially announced the merger of their civil and military helicopter production divisions, a merger that had been agreed in principle in 1990 and confirmed early in 1991, after being approved by the Brussels Commission (*LE MONDE*, 28 February).

This new industrial entity, on both sides of the Rhine, represents sales of over 10 billion francs [Fr] and it will employ 12,000 people.

After merging the "helicopter" divisions of the two groups into a subsidiary, a holding company, Eurocopter Holding SA, was created; it is headquartered in France and owned 60 percent by Aerospatiale and 40 percent by MBB. Eurocopter Holding SA will control three subsidiaries: Eurocopter-France (the Aerospatiale subsidiary), Eurocopter-Deutschland (the MBB subsidiary), and

Eurocopter-International, which was created in May 1991 and is a marketing GIE [economic interest group].

Excluding the former USSR and the U.S. military market, Aerospatiale holds 27 percent of the world helicopter market, and MBB about 4 percent. In addition to civil products, the new holding is expected to develop the military helicopters Tigre and NH-90.

France: Details of Cazeneuve, Somab Machine Tool Merger Announced

92WS0257B Paris *COMPOSITES ET NOUVEAUX MATERIAUX* in French 30 Dec 91 p 6

[Article: "Cazeneuve/Somab Agreement: Financial Position Made Public"]

[Text] Announced several weeks ago, the agreement between Cazeneuve and Somab, two companies well known in the machine tool sector and specializing in numerical control lathes, had a financial aspect that had not yet been made public. In this sector, where foreign takeovers abound, the point was to encourage a French-French alliance on this occasion. The new entity has in fact thus become one of the largest national groups (400 persons) to manufacture numerical control lathes, with revenues that should range around 400 million francs in 1992.

Cazeneuve, located at Pont l'Eveque in the Isere, and at Albert in the Somme, was of nearly the same size as Somab, located at Moulins in the Allier. Isolated, the two companies whose financial situations were satisfactory, were more vulnerable. Together, they can plan their development with relative confidence, particularly for exportation, since they now are sufficiently large to resist the increasingly strong pressure of Japanese and German firms. Moreover, these two enterprises, whose product lines are complementary, will be able to restructure their production facilities and intensify their research and development efforts. The financial operation itself resulted in a capital increase, with Cazeneuve now holding 50 percent of Somab's capital, while the outside investors Avenir Enterprise and Sofimac, with Siparex in the lead, are holding 15 percent.

SGS-Thomson Seeks Electronics Partnerships With Philips, Bosch, Alcatel

92WS0161B Paris *LE MONDE* in French 15 Nov 91 p 26

[Article by C.M.: "Franco-Italian SGS-Thomson Has Talks With Philips, Bosch, and Alcatel"]

[Text] With a green light from French authorities, SGS-Thomson is determined to revive European cooperation in electronic components, which was derailed in the space of a few months by defections on the part of two of its three main pillars. In September 1990, Dutch Philips abandoned its efforts to develop new-generation static RAM [random access memory] modules, as well as its research in liquid crystal screens, sensors and junction lasers. Ten months later, Germany's Siemens, with which SGS-Thomson had opened talks about possible cooperation in semiconductors, opted to team up with America's IBM. Since then, the Franco-Italian firm, a

subsidiary of Thomson-CSF and IRI [Institute for the Reconstruction of Industry], the Italian state industrial holding company, has been desperately seeking partners.

SGS-Thomson is canvassing for support from its principal European clients—mass-market electronics manufacturers and telecommunications companies that have every reason to want to maintain an autonomous (non-American, non-Japanese) source of supply in the Community.

The Franco-Italian firm's idea is to obtain the financial support it requires from these major consumers of components, both to guarantee continued adequate funding for research, which is extraordinarily costly in this sector, and to resist the price war the Americans and Japanese are waging in this market.

France's Alcatel-Alsthom has been approached on this. In addition, Mr. Dominique Strauss-Kahn, the ministerial delegate for industry and external trade, indicated on Wednesday 13 November that preliminary talks were under way "with a German and a Dutch firm," namely the Robert Bosch group and... Dutch Philips. Financial support modalities are still to be worked out. Possibilities might include long-term supplier contracts (with SGS-Thomson's clients making commitments to buy specific quantities at a set price) or equity participation. The subject is expected to be discussed on Monday 18 November in Brussels by the council of European industry ministers.

SGS-Thomson, Philips To Cooperate on Integrated Circuits

92WS0185B Paris *L'USINE NOUVELLE* in French
21 Nov 91 p 29

[Article by Dominique Commiot: "SGS-Thomson Calls Its Customers To the Rescue"; first paragraph is *L'USINE NOUVELLE* introduction]

[Text] The EC's ministers of industry are hopeful that they can promote alliances and spur users to invest in the capital of semiconductor manufacturers.

In a small step forward to regroup Europe's microelectronic forces, SGS-Thomson and Philips announced an agreement to develop submicronic CMOS (complementary metal-oxide semiconductors) integrated circuits Monday. Although Philips has been negotiating closer ties with Matsushita for semiconductor production for many months now, this shows that the Dutch group "is far from having lost interest in European projects," comments Dominique Strauss-Kahn, the French minister of industry.

The work will primarily involve the basic technologies for producing 0.5-micron etched circuits, which have already been mastered by IBM in its Corbeil-Essonnes factory and by the Japanese. Development work will be carried out in the "Grenoble 1992" pilot plant that

SGS-Thomson and the National Center for Telecommunications Studies are building in Crolles. The factory should be up and running in the second half of 1992, and the first joint project of Philips and SGS-Thomson should be carried out at the end of 1993.

This agreement gives concrete echo to the decision of the EC's ministers of industry, who met the same day in Brussels, to support European companies by encouraging alliances and prying open outside markets.

The idea behind this industry rapprochement is to create clubs of European semiconductor consumers, both to ensure stable market outlets for the industry and to shore up the financial capacities of producers by convincing users to acquire a share of their capital.

The survival of SGS-Thomson depends on it. The joint Thomson-IRI/Finmeccanica (Italy) subsidiary has only 2.7 percent of the world market, with sales of 8.5 billion French francs [Fr] in 1990. The company is carrying debt of Fr5 billion. And its managers estimate that it will need funds of Fr3 billion to break through the 5-percent mark in the world market.

SGS is trying to convince its big customers, all of whom are European (Siemens, Alcatel, Philips, Bosch) except IBM, to share its financial risks. And it is seeking to increase its [market] shares among the other big EC consumers, notably Bull. Although the agreement with Philips is merely technological, not financial, it is a first step.

Deutsche Aerospace, Jenoptik Form Space Research Joint Venture

92WS0178A Paris *AFP SCIENCES* in French
14 Nov 91 p 10

[Article: "Jenoptik-Deutsche Aerospace Joint Venture in Space Research"]

[Text] Berlin—On 11 November, Deutsche Aerospace and Jenoptik Jena, the former giant of the East German optics industry, established a joint venture company specializing in space research, according to an announcement from the German press agency, ADN.

Called Jena-Optronik, the company intends among other things to develop high-precision optical equipment for satellites and planetary observation stations, as well as ultra-sophisticated electronics equipment for airplanes and trains.

Under the accord, which was signed at Iena (in the southern part of the former GDR), Deutsche Aerospace has 51 percent and Jenoptik 49 percent of the stock. The new firm is capitalized at 5 million German marks [DM]. Jena-Optronik expects turnover of DM12.5 million in 1992 and plans to employ up to 200 people "over the medium term."

The joint venture company, the first of its kind in Germany in the space domain, plans to work first on

creating an apparatus to photograph the planet Mars and developing a pollution research satellite.

Jenoptik Jena is the successor to the former state-owned group Jenoptik Carl Zeiss Jena, one of East Germany's most illustrious high-technology companies, which specialized in optics for both civilian and military use. The manufacturer has 15 years of experience in the space domain, thanks to various contracts with Soviet industry. Deutsche Aerospace has ties with numerous firms in Germany's aeronautical sector, including Deutsche Airbus, Motoren und Turbinen-Union (MTU) and Dornier.

Jenoptik, Sandoz Merge Antipollution Activities

92WS0217E Paris *AFP SCIENCES* in French
28 Nov 91 p 57

[Article: "Jenoptik and Sandoz Form a Mixed Company"]

[Text] Iena—The former East German industrial optical giant Jenoptik GmbH and the Swiss chemicals group Sandoz created a mixed company specialized in pollution control 22 November.

According to the terms of the agreement that was signed between Jenoptik's director, Mr. Lothar Spath, and the vice president of the Swiss firm, Mr. Rolf Schweizer, Sandoz will hold 51 percent of the mixed company's capital and will manage it. The company will have registered capital of one million marks to start with and will initially employ one hundred people.

Sandoz is the first foreign partner of Jenoptik GmbH, which is the heir to the former industrial optical company Carl-Zeiss Jena, the technological flower of the ex-communist regime. Mr. Spath announced that two mixed companies would be created in the next few weeks, with another Swiss firm and a Dutch partner.

The mixed company Sandoz-Jenoptik is particularly interested in manufacturing equipment to combat pollution (an especially acute problem in East Germany, where environmental protection was virtually non-existent for 40 years) and to recycle garbage.

CORPORATE STRATEGIES

Dassault's New Economic Plan Recommends Personnel Cutbacks
92WS0245C Paris *LE MONDE* in French
19 Dec 91 p 34

[Article: "Dassault Expecting Three Difficult Years"]

[Text] Addressing his group's enterprise central committee on Tuesday 17 December, Mr. Serge Dassault, chief executive officer of Dassault Aviation, acknowledged that the group was facing three difficult years that

warranted "a three-year savings plan." The plan provides, among other things, for the elimination of 700 to 800 of the 12,000 jobs in the group. These three difficult years are due to poor sales of civil and military aircraft, which should continue until 1995, when the Rafale, the Falcon-2000, and the Mirage 2000-5 (the "export" version of the Mirage 2000), which are self-financed to a large extent (ranging from 100 percent to 25 percent) by the Dassault group, are scheduled to roll out.

France: Sextant Avionique's Civil, Military Programs Reviewed

92WS0167K Paris *LE BULLETIN DU GIFAS*
in English No 1540, 24 Oct 91 pp 1-4

[Article: "Sextant Avionique: Two Years After Founding"]

[Text] In its present form, SEXTANT Avionique:

- employs 9,150 persons (of whom 3,100 are engaged in the industrial component branch);
- operates 9 major facilities in France: MEUDON LA FORET, VELIZY, BORDEAUX, VALENCE, ALES, CONFLANS Ste HONORINE, CHATELLERAULT, VENDOME, ORLY;
- its worldwide network includes subsidiaries, offices and agencies all over the globe.

The most significant effects of the re-structuring were changes in the form of the organization itself:

- Last May, SEXTANT Avionique's Flight Instruments Division, formerly scattered over several sites (Paris area, south-west, south-east, west Atlantic areas of France and abroad) was consolidated at Conflans Ste Honorine. This Division accounts for 16% of turnover and employs 320 persons. The Division is engaged in numerous major programs: Airbus, Boeing, Mirage, Rafale and AEROSPATIALE helicopters, for which it supplies conventional instrument panels (indicators, altimeters, airspeed indicators), liquid crystal indicators (FPI Flat Panel Instruments), airspeed barometric probes and other sensors.
- The Airborne Radio Division (formerly EAS), although technically very advanced was insufficient in size and during the first half of the year was made over to THOMSON and incorporated into the latter's Communications Branch.
- In the Industrial Components activity, the Automation Component and Household Appliance Divisions, whose activities are synergistic, have been melded into one, to form the Industrial Components Division.
- A single subsidiary has been set up at Miami: SEXTANT Avionique Inc. which replaces various insufficiently staffed and equipped offices formerly operating in the USA. SEXTANT Avionique Inc. operates a computerized maintenance center there to provide

support for all products made by the Group and operated on the American Continent. This office also has a marketing/prospection role in conjunction with the Seattle office.

- Much has also been accomplished on the social level. Negotiations with social partners resulted, last April, in the signing of a single charter applicable to all personnel, regardless of entity.

On the economy level, key dates in 1991 were:

- the world trend towards disarmament leading to cut-backs in defence budgets;
- a slump in the carrier trade because of the Gulf war. Activities have still not returned to former levels.

These two factors have combined to cause a slowdown in the aeronautical and defence industries for the first time.

As indicated by figures for the first half of 1991, SEXTANT Avionique has not been spared.

A comparison of consolidated data for the first half of 1990 and 1991 indicates a 6% retraction (for a constant structure) in turnover, which on 30 July 1991 stood at 2.7 billion FF. Against the same period in 1990 net profits plummeted from 107 to -17 million Francs.

On the civil aeronautical market sales volume was sustained for production equipment sold to aircraft manufacturers. On the other hand, the transportation crisis and Gulf war caused significant reductions in the sale of spare parts to airlines. The financial crunch felt by airlines only amplified the problem by forcing SEXTANT Avionique to deal with certain high-risk customers.

On the military market, anticipated reductions in production items for French and other programs affected profitability, precisely at a time when research and development work, both, low or negative profit generators, were in a particularly active phase.

Activities

In Aeronautics, Space and Defence, SEXTANT Avionique operates six Divisions engaged in the following activities:

- Flight guidance.
- Display and Interface.
- Navigation.
- Panel Instruments.
- Space.
- Automatic Testing.

A percentage of the work done by the Industrial Components Department also concerns the aeronautical industry (thermal circuit breakers for the Airbus, pilot handgrips for helicopters such as the Tigre, etc.).

Civil Programs

Airbus:

SEXTANT Avionique is a leading equipment vendor for the Airbus A340. Products supplied include flight guidance, display, panel instruments, laser and conventional airspeed barometric instruments and components for electric protection.

For each aircraft, the firm supplies 16 flight guidance computers of nine different types, the equivalent of 180 litres of electronic equipment. Of the nine computer types supplied, six are in-house productions and three are developed under cooperation arrangements (AEROSPATIALE, SIMMONDS PRECISION, HONEYWELL). SEXTANT Avionique is a vendor to the three major industrial partners in the A340: DEUTSCHE AIRBUS (cabin environment), AEROSPATIALE (cockpit and piloting) and BRITISH AEROSPACE (fuel systems and landing gear).

The instrument panel of the A340 carries six display screens equipped with a new, highly powerful symbol generator computer developed in cooperation with VDO-Luft. A landing display may be supplied optionally as basic equipment.

Boeing:

BOEING has recently selected SEXTANT Avionique to supply the airborne printer of the Boeing 777. As prime contractor, SEXTANT Avionique cooperates with the American firm SUMMIT AVIONICS. This printer can form an interface with major airborne systems such as the AIMS (Aircraft Information Management System), ACARS (Airborne Communication Addressing and Reporting System) and ELS (Electronic Library System).

Commuter Service:

SEXTANT Avionique is making ready for new opportunities opening in this field and is now proposing an integrated modular avionics package adapted to the needs of this market. The first application planned is the European DAA-92-122.

Military Programs

The Rafale:

Fly-by-wire and electronic flight control for military aircraft is the ideal field for SEXTANT Avionique, as illustrated by the significant contribution made in the avionics of the Rafale ACT/ACM. All equipment selected for this aircraft: Flight path computer, GPS, liquid crystal lateral displays, head-up and median displays with the associated symbol generator boxes, system dialogue station, mobile multi-function probe and permanent emergency instrumentation embody technical innovations demanded by this aircraft destined to become a complex new generation weapon.

The two lateral LCD displays flew for the first time ever on 19 May, in conjunction with the Rafale. This 5" x 5" display provides man-to-machine dialogue, will display aircraft systems, indicate warnings, and indicate the

appropriate corrective action plus showing images received. A vast store of symbols will be available.

Retrofit:

SEXTANT Avionique is offering its liquid crystal display technology in the USA in the form of a retrofit package of the C130 and C141 carriers operated by the USAF. The firm has been selected within one of the three consortia competing for the retrofit contract. SEXTANT Avionique would supply the first 6"x8" liquid crystal displays while taking full account of military performance and environments. The call for bids is expected for the end of 91 and should open the way to the appointing of a prime contractor before the end of this year.

ATF:

Last April, SEXTANT Avionique granted a fabrication license to KAISER Electronics, one of the leading American manufacturers of display systems for military aircraft, covering liquid crystal screens developed by SEXTANT Avionique and THOMSON-LCD for application to future American fighter aircraft.

One of the first applications of the agreement could be the tactical fighter of the US Air Force, YF22, developed by LOCKHEED/BOEING/GENERAL DYNAMICS. As a member of this team, KAISER will be supplying multi-function, high definition color displays for the ATF (Advanced Tactical Fighter).

Final evaluation is now being made of the proposals submitted to KAISER by SEXTANT Avionique as part of their mutual agreement. A final decision in favor of KAISER is expected by the end of this year.

Helicopters:

SEXTANT Avionique is an essential supplier for the avionics of the Tigre (automatic flight, displays, navigation, instrumentation). In this program, the firm is engaged in no fewer than six partnerships with German firms (TELDIX, MBB, LITEF, RODHE and SCHWARZ, VDO-Luft, Nord Micro).

SEXTANT Avionique was naturally involved in initial Tigre flights, supplying a digital and analog data acquisition and processing system, conventional instrumentation, autopilot and the pilot handgrips.

Lead-off prototypes of the binocular helmet sight have already been delivered to AEROSPATIALE. They give a 40° field of vision and are used for selecting video symbology and images generated by a conventional or thermal camera slaved to head direction.

Having gained much experience as a system vendor and partner in this program, SEXTANT Avionique is in an excellent position to offer its services for the NH 90.

Space:

SEXTANT Avionique is one of Europe's foremost equipment suppliers for space applications. Aside from its participation in each Ariane launching (central gyro-laser data system, store, supply of the piloting-guidance computer, electronic components for the piloting controls), the firm is engaged in major programs of the 90s. Approximately 180 electronic equipment items and airborne data processing equipment will be built and delivered, representing over one ton in sheer weight. AEROSPATIALE has already chosen SEXTANT Avionique to supply liquid crystal display equipment for the Hermes.

This rapid review of the Group's activities indicates the multiplicity of activities pursued.

It also points up the strong presence of SEXTANT Avionique in major programs now in development: Rafale, Tigre, Airbus A330/A340, Ariane 5 and Hermes, the soon-to-come NH 90, commuters, etc.

The scope of research and development work that this diversity entails is one reason for the short-term regression but in the medium term can only prove a background for an excellent recovery in Group activities.

**France: Passive Components Industry Future
Called Bleak**

*92WS0124B Paris L'USINE NOUVELLE in French
17 Oct 91 p 23*

[Article by Jean-Pierre Jolivet: "Passive Components S.O.S.," first paragraph is L'USINE NOUVELLE introduction]

[Text] The majority of the sector's industries are made up of small and medium-sized companies that cannot afford the development investments that would hoist them to the level of international competition. The trade deficit is worsening.

France's passive components industry is suffering. The top French manufacturer of aluminum condensers, Sic-Safco, and MCB Company, which specializes in sensors, have just been placed under court administration for insolvency. After appealing to the prime minister through full-page articles in the country's daily newspapers in July, SYCEP (the industry's trade union), is putting out an S.O.S.

The situation has deteriorated further in just a few months. French manufacturers, who racked up sales of 13.5 billion French francs [Fr] in 1990, fear a 5 percent decline in their business. In any event, the trade deficit is sure to worsen: 1987's 90-percent coverage rate dropped to 66 percent in 1990, and will fall below 60 percent this year.

The trend is worrisome considering the key part passive components play in electronic equipment, from military and computer hardware to telecommunications and auto electronics. After semiconductors, French passive components may now stumble...and a new segment in the nation's electronics industry may collapse. With 26,000 workers, passive components account for 12 percent of electronics jobs. The threat has prompted government authorities to revise upwards the Fr40 million aid package planned for 1991. But that is still a far cry from the annual Fr700 million that SYCEP estimates is needed to save the industry.

The problems of the French passive components industry continue to pile up. Its 250 companies are essentially small and medium businesses. "Of the 120 companies registered in our union, only 14 employ more than 500 workers," says Marc Henry-Biadaud, president of SYCEP. Leaving aside the American and Japanese giants, these small companies make a poor showing next to their German counterparts: Annual sales per company in Germany, for instance, are twice as high.

Such circumstances make it tough to double the development investments (now 6 percent of the firms' sales) that would make it possible to catch up with the competition. Indeed, the cost of technology changes is rising steadily, and our manufacturers must compete with rivals that are becoming international in scope: Matsushita and Siemens are now allies, Kyocera has taken over AVX, and Vishay has just bought the "tantalum condensers" business of the top American company Sprague. Even LCC, a subsidiary of Thomson-CSF, has been forced to ally itself with Japan's Murata to gain the technological and international foothold that will allow it to survive.

This avalanche of threats is spurring French manufacturers to consider forming groups in areas of strong technological potential. For they are all well aware that the industry's salvation lies in European alliances.

SGS-Thomson Plans Survival Strategy

92WS0149A Paris *L'USINE NOUVELLE* in French
31 Oct 91 p 26

[Article by Jean-Pierre Jolivet: "SGS-Thomson Falls Back on Specific Niches"; first paragraph is *L'USINE NOUVELLE* introduction]

[Text] Unable to survive as a generalist, Europe's second largest chip manufacturer is concentrating on telecommunications, consumer and automobile electronics, and informatics....

It is the moment of truth for SGS-Thomson, Europe's second largest chip maker. Without officially admitting it, general manager Pasquale Pistorio is going to have to revise his ambition of making the company a leading producer of general-purpose semiconductors. For lack of an accord with Siemens, which Thomson CEO Alain Gomez now heatedly rejects, in light of the German firm's recent accord with

IBM in the electronic memory field. And for failure to reach the critical 5 percent threshold in world market share needed to survive as a generalist.

For some months now, SGS-Thomson has been putting together agreements in specific market niches. In early June, it signed a "second source" agreement allowing it to manufacture and market Sony's integrated circuits for digital video transmission. Then it signed a cooperation agreement with Britain's GEC Plessey Semiconductors to develop semicustom circuits. And Innos, an SGS-Thomson subsidiary, acquired an IBM license to manufacture and sell high-resolution graphics chips developed by the world's biggest computer company.

At the same time, the Franco-Italian group is trying to strengthen its relations with major customers such as Alcatel NV, its biggest client. The two companies have multiyear semiconductor supply agreements. Telecommunications, consumer electronics, informatics, and automobile electronics (with Magneti Marelli) are the targeted fields.

In search of captive markets, SGS-Thomson plans to create—in collaboration with the group's consumer subsidiary, Thomson Consumer Electronics (TCE)—a joint integrated circuit development center for consumer products. The chips will be used in TCE's audiovisual equipment and will increase its sales within the group (currently 10 percent). Also, SGS-Thomson has been selected by France Telecom to develop circuits for France's future videophone. After a five-year struggle to become one of the "leading lights" in the semiconductor field, SGS-Thomson now has little choice but to break off the effort. Despite its heavy investment commitment—entailing cumulative losses of more than 2 billion French francs [Fr] since it started up in 1987—it has failed to reach the critical threshold of 5 percent world market share. As the world's 12th largest maker of semiconductors, it barely holds down a 2.7 percent share!

The two principal shareholders, Thomson CSF (45 percent) and IRI-Finmeccanica (45 percent), refuse to continue pouring money into it. Beginning with Thomson. This year, SGS-Thomson's losses are expected once again to reach Fr500 million, though Alain Gomez had expressly told Pistorio to get back in the black. That objective will not be reached until 1992. And the investments required exceed the financial capacity of a single company. In this field, a Fr1 gain in market share requires Fr2 of investment. "To compete with the big semiconductor companies, European industry would have to invest at least \$10 billion over the decade. In addition, the three European producers would have to form an alliance," concludes consultant Robert Heikes, former head of National Semiconductor Europe, in a just-published report.

New Shareholders

SGS-Thomson executives realize they are going to have to "shorten their sails." Certainly faster than they expected. "With turnover equal to \$90,000 per employee, we are not yet competitive. The objective is to raise that figure to \$100,000 by the end of 1992," says

Pistorio. The scene is set. Already, in the United States, facilities at Phoenix and Colorado Springs have shut down, and the Newport facility (Great Britain) is getting ready to do the same. The French facility at Rousset (Bouches-du-Rhone) has eliminated 150 jobs. In a single year the reorganization has already entailed the loss of 3,500 of the group's 21,000 personnel positions, and it may require the elimination of 1,000 to 1,500 more jobs in 1992.

The strategy of falling back on its strong points, including dedicated and EPROM [electrically programmable read-only memory] circuits, of which SGS-Thomson is the world's third largest producer, may even accelerate the process. Unless the political authorities—along with the industries that consume electronics components—decide to do something about it. This is the direction Pistorio is heading in his search for new financial partners. If he fails, it may be the end of 15 years of French ambitions in the semiconductor field.

SGS-Thomson Seeks Partners To Alleviate Financial Difficulties

92WS0225B Paris *LE NOUVEL ECONOMISTE*
in French 15 Nov 91 p 35

[Article by Christine Baudelaire: "Components: Breaking Up; SGS-Thomson Desperately Looking for New Shareholders"]

[Text] On the components market, the worst still lies ahead, according to Mr. Jacques Bouyer, president of the Electronic Industries Group and president of Philips Components. "Does it take such dismal economic conditions for everybody to mobilize?" Government experts, and first of all Mr. Dominique Strauss-Kahn, minister of Industry, expect to see the European components industry rise from its ashes, under a new guise, around the French-Italian SGS-Thomson (ST) company and major European chip users. Negotiations have started between ST, its shareholders, Thomson, and the Italian state-owned company IRI [Institute for the Reconstruction of Industry], and groups like Alcatel, Fiat, and Bosch.

Few people will now question the strategic role of semiconductors, but their survival in Europe is far from certain. Definitely pessimistic, consultant Pierre Audoin stated that, if the trend of the eighties continues, Europe—which still accounted for 20.5 percent of the world semiconductor market in 1979—will be nearly erased from the map by 1995.

Barely one year ago, the French government, imitated later on by the Brussels commission, placed its hopes in a partnership between the components divisions of the three large European companies, Philips, Siemens, and SGS-Thomson. As months went by, their illusions fell victim to declining markets and increasing losses. This year, Mr. Jan Timmer, the Philips chief executive officer [CEO], discontinued much of its semiconductors R&D efforts. Worse, he is now negotiating with the Japanese

Matsushita. In July, Siemens finally agreed with IBM to build a joint dynamic-memory production unit, as these are in great demand for computers. And Mr. Alain Gomez, the Thomson CEO, officially buried his hopes around mid-October when he told financial analysts: "The prospects for agreements between European components manufacturers have definitely vanished."

The only remaining instrument of European independence, therefore, is SGS-Thomson. But Mr. Henri Starck, general manager of Thomson-CSF, just stated bluntly that: "The financial stakes exceed the means of the Thomson group." The French-Italian company is presenting its shareholders with a dual financing problem: in the short term, that of its unbalanced balance sheet, which shows \$900 million in debts for \$1.5 billion in sales; in the intermediate term, that of its development in an extremely capital-intensive sector. Last year, financial expenses accounted for \$65 million out of a loss of \$96 million. "We have an equity imbalance of \$450 million," Mr. Pasquale Pistoria, general manager of SGS-Thomson, explained. To please his shareholders, he intends to show that he can make money. His goal is to reduce his personnel by 18 percent this year, and he is ready to go farther to achieve his profit and productivity objective of \$100,000 of sales per person by the end of 1992.

In the intermediate term, what is at stake is the critical weight, which experts usually place at 5 percent of the world market. ST managed to get only 2.7 percent. "The market is expected to reach \$200 billion by the end of the decade," Mr. Pistorio figures, "5 percent will mean \$10 to 12 billion." But in this sector, you must invest one dollar for each dollar of additional sales. In other words, SGS-Thomson needs new shareholders.

A Users' Club

In a first stage, as a way to secure markets, Mr. Pistorio signed marketing agreements with some of its customers: Thomson Consumer Electronics, Alcatel, as well as the Italian Marelli, the German Bosch, and Nokia. The idea is to strengthen ST's marketing base through the creation of a sort of "users' club," some of which would also be (minority) shareholders. According to Mr. Strauss-Kahn's staff, they are rather encouraged by the response, in particular, of the Italians of Fiat and the Germans of Bosch. Actually, computers remain the leading market for components, but European computer manufacturers are doing very poorly just now. And Alcatel reserved its answer to the Ministry of Industry's request. "We can increase a little our purchases from ST," Mr. Francois Petit, Alcatel development manager, explained, "but our goal is not to become component manufacturers. Eventually, ST will have to take a partner, and that will have to be an American company."

Alcatel CEO Presents Strategies, Contracts

92WS0129H Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 14 Oct 91 pp 21-22

[Article: "Alcatel Outlines Strategy and Announces Further Contracts"]

[Text] Chairman and Chief Executive Officer of Alcatel, Pierre Suard, last week gave a speech to journalists at the Telecom '91 show in Geneva that outlined recent developments in the company's structure and gave some indication of how these changes would be integrated into the current organisation. He also revealed some details of new contracts won by the company recently.

United States...

M. Suard started by giving details of the company's new organisation in the U.S. Newly-acquired Rockwell Transmission Systems division is in the final stages of being merged with Alcatel's existing US subsidiary Alcatel Network Systems, with headquarters relocated to Rockwell's existing location in Richardson, Texas. Alcatel will now have over 700 engineers working on the development of a complete range of SONET-compliant transmission systems. Alcatel believes itself to be the second largest supplier of transmission systems in the US market, behind AT&T.

Italy...

With regard to the company's acquisition of Telettra in Italy, M. Suard is still clearly not happy with current EC competition policy. The Commission's review of the possibility that Alcatel would become the dominant supplier of transmission equipment in Spain and subsequent conditions for allowing the merger, caused a six-month delay in the start of the acquisition, which finally got underway in April 1991. Now, the merger of Telettra and Alcatel FACE is almost complete, Suard said. When complete by the end of the year, a new company will emerge, Alcatel Italia. The headquarters of the company's transmission division will be then moved from Paris to Milan. Close coordination will be maintained between Alcatel's new operations in Richardson and the new HQ in Milan.

M. Suard made no comment on the progress of negotiations with Telefonica in Spain with regard to the fulfilment of the Commission's two remaining conditions—the repurchase of the Telefonica shareholdings in Telettra Espana and Alcatel Standard Electrica.

Pacific Rim...

In the Pacific rim, Alcatel was able to announce two new developments. Firstly, that the Australian Telecommunications Ministry had selected the company's GSM system and that the company had already made a proposal in response to a call for tender. Expecting a final decision soon, Alcatel hopes to be selected to supply

complete GSM systems for Sydney, Brisbane and Canberra. M. Suard also revealed that a number of other non-European countries are showing interest in adopting the GSM standard, including China and Taiwan and South Africa which has recently adopted the standard.

Alcatel also confirmed that a consortium led by Submarcom had been chosen to supply and install the 18,000km cable system for the SEA-ME-WE 2 project. AT&T and STC are both partners in the US\$660 million project. No further details were available but *ITI* understands that AT&T will be supplying the section in the Middle East, including sections in the Suez Canal and across the Mediterranean connecting to Cyprus and Turkey.

Kuwait...

In war-ravaged Kuwait, Alcatel CIT has been selected as one of three suppliers of central office switching equipment as well as a supplier of optical fibre cables. So far, Alcatel orders amount to FFr94 million. The other two suppliers of switching equipment will be GPT and AT&T.

Hungary...

In Eastern Europe, M. Suard outlined his company's successes in Hungary. Alcatel Austria (60 per cent of the shareholding) has formed a new joint venture with the Hungarian State Railway Company (30 per cent) and an independent railway operator (10 per cent). The independent operator is responsible for operating links between the two countries. The joint venture will supply a complete signalling and telecommunications system.

The company also added that it was very satisfied with the first full year of operations of its other joint venture company in Hungary, Videoton-SEL Telecommunications, concentrating on business systems, where the company has already acquired a 20 per cent market share.

United Kingdom...

In the UK, Alcatel announced formally the formation of Alcatel Network Systems, a company designed to penetrate the newly-emerging network equipment markets resulting from the UK's Duopoly Review. Headed by ex-ICL, STC and GPT employee, Philip Dobby, the new company will initially focus on three areas in the UK—negotiating contracts with BT and Mercury for the supply of SDH transmission equipment, similar attempts to supply MANs and thirdly, seeking out new opportunities provided by new entrants in the operators sector, such as British Waterways and British Rail.

Dobby intimated that the company will not attempt to become a fifth supplier of switching systems to BT or a third to Mercury. Work on SDH systems will be integrated with similar work being conducted in the UK by Telettra. Developments at Alcatel Network Systems in the UK will be overseen by Alcatel Bell Telephone in Belgium which will have the majority shareholding. Telettra is also likely to hold a share.

The formation of a subsidiary was the only way left open for Alcatel to enter the UK network market, company sources said. "There was nothing left to acquire," one said.

Brazil/South America...

In Brazil, where Alcatel has a 23.9 per cent stake in Standard Telecommunicacoes Group, the second largest local telecommunications equipment supplier, Alcatel will increase its shareholding as soon as Brazil's privatisation legislation is completed. The local company has a 20 per cent share of the local switching market, 18 per cent in business systems and 50 per cent in transmission.

Alcatel has already supplied its first Alcatel 1000 S12 in Brazil and recently, Alcatel Standard Electrica of Spain signed contracts to supply transmission equipment to Peru and Uruguay.

Japan...

Josef Cornu, Executive Vice President, Technical Operations, passes off questions concerning recent western penetration of the Japanese market by a number of other companies, by questioning whether such participation in research projects is really worth it, given that to be accepted for participation in only small parts of the R&D projects, Western companies must open up their research laboratories to NTT. Watch out for back-door entry in Japan through the new connection with Rockwell.

Daimler-Benz To Become Integrated High Tech Firm

Reorganization Plans

92WS0154A Munich TOP-BUSINESS in German
Nov 91 pp 62-66

[Article by Anton Hunger: "With Scalpel and Crowbar"]

[Text] Karl Dersch (56), marketing chief of Deutsche Aerospace AG (Dasa), celebrated his 40th year in service with the Daimler-Benz company, and everyone of rank and name came: group CEOs Edzard Reuter [Daimler], Werner Niefer (Mercedes) and Juergen E. Schrempp (Dasa), the colleagues on the board of Daimler-Holding and its subsidiaries, as well as the youngest political star in Bavaria, Peter Gauweiler (CSU).

The most beautiful gift brought along for the honored one was presented by group manager Reuter in front of everyone. In his laudatory speech, he referred to the fact that the hierarchies are being demolished and the group is becoming "slimmer, more mobile and more efficient" for the purpose of its own survivability: "It is now time," Reuter's message went, "to assume that the present structures of the house are not God-given."

To the celebrant these words acted as balsam on the wounds. Having been smiled at condescendingly throughout the group for failing to take forceful action at the subsidiaries Messerschmitt-Boelkow-Blohm (MBB), Dornier, Telefunken System Technik (TST) as well as Motoren and Turbinen

Union (MTU), he is finally able to wheel and deal the way he wants to. In the future, the marketing strategies and concepts will be written by him at Dasa Holding and no longer at headquarters by the parent companies.

This procedure, however, does not seem to be the sole reason for the excited mood in the company at the present time. Two and a half years after the founding of Dasa, a medium-sized earthquake is shaking the space and aviation group to the core:

- The previously independent companies MBB and TST are being dissolved and integrated with Dasa by March of next year.
- The business management level is being eliminated without replacement; business directors Dr. Carl Peter Fichtmueller and Dr. Wolfgang Piller (MBB) and Dr. Torolf Blydt-Hansen and Dr. Eberhard Zur (TST) will assume directorship positions, and the respective personnel chiefs Walter Komann (MBB) and Klaus Joel (TST) will be offered new jobs within the group.
- Analogously, the thinning out is also taking place at Dornier, but this group company is to remain as an independent company for legal reasons (testamentary will).
- The same applies to MTU. Due to the imminent capital commitment by U.S. engine manufacturer Pratt & Whitney at MTU, the Turbinen subsidiary will also remain a GmbH [limited liability company].

Altogether, with this drastic reorganization Dasa boss Juergen E. Schrempp is freeing up to 400 overhead positions as well as the Dasa center at Leopoldstrasse in Munich. The 270 management people at headquarters will move as early as next summer to the already empty offices at MBB in Ottobrunn. This tough cutback is already Schrempp's second coup, after the Dasa chief, endowed with a boundless desire to succeed, established the business areas of space, aviation and defense straight across the still formally independent companies.

But the events taking place right now at Dasa are only the precursors for a broadly based reform of the organization's head as well as the limbs, which will soon encompass the entire Daimler-Benz group. Because Reuter, sometimes described as a waverer, will now finally have to do the job properly, unless he wants to watch his vision of an integrated technology group get torn apart in the struggle for territory between the company separatists. After all, business—apart from Mercedes—is not quite as good as originally hoped.

The Daimler manager must therefore urgently

- slim down AEG so much that it becomes profitable again (estimated losses for 1991: about half a billion marks);
- force Mercedes-Benz to exercise cost containment, so that the group's golden goose may achieve premium results in the future as well;
- create the critical mass in the international market for the subsidiary service corporation Debis, so that it does not just earn its money from the group companies;

- finally utilize the synergy effects in the group, break the inefficient structures from above, slim down the organization and sharpen the employees' consciousness of the overall well-being of the nearly 100-billion German mark [DM] empire.

What can be seen so far after five years of acquisition and building work does not have much to do with the claim of being an integrated technology group, at least. A willingness for unconditional cooperation is still lacking within the entire conglomerate. Just as three or five years ago, any part of the group could split off again without problem, be independently managed or disposed; the individual company cultures are still anything but compatible. This is not the way Reuter had envisioned the setting out for new shores.

Most of all, he is likely to be irritated by the annoyance that has built up in the managers at Mercedes. They almost feel as if they are the paymasters for the expansion of sister companies like Debis or the financiers of mismanagements such as AEG. And precisely for that reason they are simultaneously forced by the parent company to undertake drastic savings. According to the most recent overhead value analysis (GKW) by Germany's professional consultants, McKinsey, they must save DM3 billion annually—in other words, undergo a drastic cure for the lack of capability of others, for the disarmament offensive by the politicians, for the egotism of the Dornier family clan, which does not hesitate to play monopoly with its employees in order to rake in even more influence and money from the rich uncle.

No wonder that the Mercedes people do not want to join in the game. Right now they are apparently trying to reshape their internal financial structures in such a way that the outflow of funds goes back to the holding company. In other words: They are investing as fast as possible in factories and machines. Most of all they would also like to decide in favor of the billion-mark toy Formula 1, if opposition in the group were not so great.

Even if the vice president of Mercedes Helmut Werner declares the massive investments to be "an operational and competitive necessity," the nature of the investments indicates where the real motives of the Mercedes men lie. Just as MBB, Dornier, MTU and AEG, this branch also had to relinquish its computer center to the newly founded sister company Debis, and now it must procure its data and computer needs from it as a service.

Since the completion of the separation, however, the Mercedes specialists have been trying to build from below an intermediate data technology based on the use of networked PCs in order to continue to remain autonomous. They are thus demonstrating what they think of integration: not much—even if truck manager Helmut Werner defends these measures as necessary for corporate strategy, "because there are many things that you simply have to do in your own firm."

But Mercedes chief Werner Niefer, who travelled the acquisition route together with the head of Daimler

(Reuter: "We successfully played a wall pass"), has a split allegiance: He is judged by the success of his vehicle division, but because of his loyalty to Reuter the integrated technology group is written on his banner.

But as long as Mercedes earns money and nurtures the sister companies, Reuter is letting him have his way. Niefer is at least doing his homework: For example, at the end of 1989 automobile chief Juergen Hubbert was named director of a strategy committee, which is to impose a cost structure on Mercedes similar to the Japanese by way of slimmed-down production ("lean production"). Hubbert is able to record actual savings of about DM200 million even for this year, and in the second half of the decade, according to McKinsey information, it will be DM3 billion annually.

In this respect no area is taboo for Hubbert: The vertical range of manufacture (at present 50 percent) is to be driven below 40 percent, materials acquisition be expanded across the globe (global sourcing) and the suppliers tied more closely to the company.

New Work Structures

If all of this can be implemented comparatively smoothly, by the end of the year Hubbert will also have to deal with new work organizations and work structures (group work) as well as new wage systems. And he already knows that in that respect conflicts will necessarily erupt with the employee representatives. Central works council chairman Karl Feuerstein, not exactly known as a blind obstructionist, is already warning against overzealousness: "Problems can only be solved with us."

Thus, the planned shutdown of the Mannheim textile manufacture has only been shelved because the plant's upholsterers cannot be transferred very easily. The situation is different in Untertuerkheim: The upholstery division is being closed in 1995, after jobs have been found for the 600 employees in engine and axle production.

Although Reuter denies it (see interview on p 62 [following this article]), the problems as Mercedes are at most business as usual in comparison with "the AEG chaos" (a member of the Mercedes board). And even though the chief of Daimler is still hedging, the timetable for AEG board chairman Ernst Georg Stoeckl is now fixed in its essential outlines: Typewriter subsidiary Olympia in Wilhelmshaven (1991 losses estimated at DM200 million) is likely to be closed even this year, which will entail more than DM100 million in additional social compensation costs. The second blow to fall is the spin-off of AEG Hausgeraete AG [household appliances], as well as the inclusion of this division in a joint venture with a powerful partner. The most important condition for Reuter is that the brand name of AEG should remain in the hands of the electrical group (see interview).

As to this claim, Bosch-Siemens Hausgeraete GmbH (BSHG) is the only one offering to be a partner. According to internal plans, AEG would participate in the cooperative venture as a third parent corporation

and sell its products through its own marketing channel. The partners involved have already held extensive negotiations about this scheme, but because of the unresolved cartel situation they are "not being pursued very aggressively at this moment" (Reuter).

In any event, nothing has been decided yet in this matter. To be sure, the BSHG solution would not be unattractive to Reuter, but it does not bring any money into the empty AEG cash box. The offer from European market leader Electrolux to pay a reported DM1 billion for the household appliance division seems to suit the penniless AEG managers better. But in that case Reuter's postulate not to sacrifice the name could scarcely be adhered to.

AEG-DASA Planning Game

Who triumphs in the end and in what way depends primarily on AEG's need for funds. Basically, only the classic electrical engineering division is still earning money (in 1991 about DM80 million); railroad technology has just about a balanced operating result but is likely to slip into the red after buying the eastern German LEW locomotive factory. And now automation technology is slipping from DM230 million in profit (1989) via DM180 billion in the red (1990) to DM140 million in losses (1991).

Not much more remains. The AEG cable works are next to be divested, and at the end of the year the microelectronics division (double-digit million losses) will be brought into a joint venture with the corresponding activities at Dasa. In return, Dasa will cede its rail car construction (already decided) and its automation division (still under discussion) to AEG.

But since AEG will lack the critical mass even after these group-internal shifts, a merger with Dasa is seriously contemplated at the Stuttgart headquarters—but not until four years from now. Because the time schedule depends, among other things, on internal appointments to the top jobs: If Schrempf is chosen as Reuter's successor in early 1996, Stoeckl will lead the merged AEG-Dasa—a company which will then have a considerably reduced defense portion (Dasa at present 50 percent).

The stage would thus be set for integration in at least two company groups. And Mercedes would also be included if AEG's railroad technology were to be added to the truck division, as Reuter's planning strategists want to do. Because in the future the vehicle managers will no longer be able to sell just cars and utility vehicles; they must be able to offer solutions for transportation systems. In the next few weeks Mercedes and Debis will already find a joint enterprise to sell transportation solutions to foreign customers ("contract-hire") similar to a forwarding agent.

To Reuter all of these group-internal ties are the first steps in the direction of an integrated technology group. If he continues to march along this route, he will "go down in history," in the opinion of a prominent Siemens manager.

And if he fails? Then, according to a colleague, the damage will probably have to be measured on a national economic level.

At least one loyalist is not afraid: Karl Dersch, one of the very few who is allowed to call Reuter by the familiar you. To the former Franz-Josef Strauss confidant, SPD man Reuter is one of the rare species of managers who "have vision and fighting spirit."

CEO Reuter Defends Plans

92WS0154B Munich *TOP-BUSINESS* in German
Nov 91 pp 62-66

[Interview with Daimler-Benz CEO Edzard Reuter by *TOP-BUSINESS* editor Anton Hunger: "We Are on Course"]

[Text] **TOP-BUSINESS:** Mr. Reuter, you gave yourself 10 years at the time you prepared to create an integrated technology group from the former automobile manufacturer Daimler-Benz by purchasing the companies Dornier, AEG and later MBB. Half of this time is up, and you seem to be lagging behind in your plan.

Reuter: By and large I can only state that we are on course.

TOP-BUSINESS: But the difficulties which you are having with your new companies were not foreseeable to this extent: the enormous losses at AEG, the never-ending fight with the Dornier family companies, the shrinking defense and space budgets and the ignorance of the individual group companies with respect to integration. Aren't you worried and afraid?

Reuter: Well, when I listen to that I almost pity myself. In reality, the things you list are not that drastic by far. A lot has happened below the line since 1985, and the subject which is really involved here, meaning the formation of an integrated technology group, has nothing whatever to do with the difficulties that have surfaced in the meantime.

TOP-BUSINESS: You are playing down the problems.

Reuter: On the contrary. In your long enumeration you overlooked one entire field of activity: the automobile field. We have to work hard to assure that we are competitive here as well, of course. Do you think that is a minor problem compared to what is required at AEG?

TOP-BUSINESS: Let us stay with AEG. All the areas, with the exception of traditional electrical engineering, are in the red. And the Olympia typewriter and household appliance divisions are not only causing you trouble but also do not fit into your model of an integrated technology group for lack of synergy possibilities. There is an indisputable need for action here, isn't there?

Reuter: According to our internal company operating statement, AEG certainly still has a good bit to go until we are satisfied. According to traditional trade balance results, it does not look nearly as dramatic, since by no

means all the divisions are in the red. In fact, we have two problem children: the household appliances and the typewriters. Olympia is the main problem, and I don't need to tell you anything about that, since you have always informed your readers very extensively, although sometimes speculatively, on this topic. In the household appliance field we will iron out the dent we had last year as early as 1991. We will surely continue this division as a component of AEG, because we have now recognized that it can absolutely remain competitive in a somewhat more rationalized form. I willingly admit that perhaps it does not in an actual sense have to become a necessary component of a technology group. The household appliance division is represented in the market by a wonderful brand name, and we do not intend simply to let this advantage slip out of our hands.

TOP-BUSINESS: But in the field of domestic electric appliances there are so many companies—including Electrolux, which is taking great aim at the AEG household equipment—faced with shrinking profits.

Reuter: That is quite right, although in the case of Electrolux it is from a very high pedestal.

TOP-BUSINESS: Besides Electrolux, Bosch-Siemens Hausgeräte GmbH (BSHG) is also wooing the AEG subsidiary.

Reuter: We must simply make sure that the products are in order and that they are competitively marketed. Part of that is of course the possibility of entering cooperations with the goal of rationalizing.

TOP-BUSINESS: AEG representatives, headed by financial director Guenther Schad, have already held concentrated talks with BSHG representatives. And the subject of the conversation was not simply vague cooperation models but issues such as how AEG could participate as a third partner in the BSHG joint venture. Why are these talks not being pursued at the present time?

Reuter: It is true that talks have been held between the two firms, as well as with many other important companies. These talks with BSHG have not been broken off, but they are not being carried on so intensely because we still have a very unresolved cartel law situation. In the transition phase to the Common Market, meaning by 1 January 1993, there are extremely difficult delimitation questions from the aspect of cartel law between the relevant markets, as it is so beautifully put. For this reason we have turned down the negotiation intensity somewhat on both sides. But we agree to the extent that, if it were to come to this solution, we want to continue to be present under the respective brand names—AEG as well as Bosch and Siemens. The appeal of this scheme lies in the fact that we are not letting go of the brand name AEG, which we will absolutely not do.

TOP-BUSINESS: In the fields of railroad technology and automation technology you evidently have to buy something more in order to arm these divisions sufficiently to

compete. What do you have in the pipeline, with whom are you speaking and what would make sense?

Reuter: It is correct that these AEG divisions do not yet have the critical size in order to be prime players in the competition. But both divisions are so-called core activity fields, that is to say that we want to be a serious participant on a worldwide scale. There is still some need for action, which cannot surprise anyone who knows the history of AEG in these areas.

TOP-BUSINESS: So you are determined to reequip AEG as an integral component of the technology group with the focal points of railroad technology, automation technology and electrical engineering?

Reuter: Don't worry, that's the way it is. And, naturally, AEG will continue to push ahead even with the sector which at the moment still belongs to it alone, namely microelectronics, which will be brought into a joint venture involving Dasa and AEG.

TOP-BUSINESS: The situation with the Dornier companies has not yet been sufficiently cleared up. You bought the company for DM420 million, then you had to spend another DM300 million to fix it up. And now Dornier works council member Oscar Pauli demands that, for the sake of peace, you should buy Dornier for the third time. Can you say no?

Reuter: We do not have the slightest intention of paying the family corporation for something that already belongs to us. In order to clear up the conflicting issues, Dasa recently got together with the family corporation members and held talks which are hopeful.

TOP-BUSINESS: After all, it is not only a fight about the right course that is involved, but apparently about money.

Reuter: I can't undertake motivational research, and I don't want to either.

TOP-BUSINESS: But do explain why, shortly before Dornier Composite Aircraft, which belongs to a part of the family-owned corporation, filed for bankruptcy, Daimler-Benz gave a guarantee in the amount of DM18 million marks—funds which are now lost.

Reuter: This guarantee was by no means provided shortly before the bankruptcy, but was based on processes which go back several years. During the talks held at that time with members of the group of heirs to Prof. Claudius Dornier, this was assured by our side in order to guarantee the technology for the Seastar amphibious aircraft.

TOP-BUSINESS: Why does not Dasa take over the Seastar product, if it is such an interesting technology?

Reuter: Dasa has never made any bones about it that for structural and product-related reasons it is not interested in building or marketing this aircraft. Our readiness

consists of helping preserve the technology and the product, but not within the Daimler group.

Germany: Falling Prices, Diminished Demand Plague Software Sales

92WS0136A Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 14 Oct 91 p 10

[Article by bn: "Word Processing Was Top Seller"]

[Text] Frankfurt, 13 Oct—The manufacturer of user programs for personal computers can only anticipate a 17-percent market growth rate for the current year. Last year only about 800,000 such programs were sold in the FRG, which was the equivalent of a 31 percent increase. According to the estimate of Marktforschungs-und Beratungsunternehmen IDC Deutschland GmbH in Kronberg, which has reported these figures, a sales increase of just 11 percent may be assumed for the coming year. For 1995 a slight decrease in market volume is even forecast, which is blamed on declining demand and lower prices.

According to IDC Deutschland, this development will imply cost savings for the consumer. With the average retail price for a PC software package in 1990 costing approximately 1,460 German marks [DM], by the year 1995 this is to come down to about DM1,200. The top seller in the last few years has turned out to be word processing, of which last year more than 300,000 software packages could be sold in the German market. In second place in consumer preference were data base systems and in third place spreadsheet analysis programs. Approximately two-thirds of the investments in software do not even make it to the market in the FRG. These are in-house developments from the financial and public administration sectors.

The increasing competition, the imminent structural change, the internal EC market as well as world economic and technological changes are likely to put greater pressure on the German software suppliers, it was further said. In addition, calls for standardization, open systems, user friendliness and extensive service increased the pressure to adjust.

Strong growth impulses are expected for components of the software market, however. Industry observers thus assume that over the course of the next few years the CASE market segment (Computer-Aided Software Engineering) should anticipate between 20 and 40 percent growth rates. The market volume for Europe is estimated at 450,000 work stations at a value of approximately DM45 billion (including software and service), reports Softlab GmbH.

Italy: Fiat Group Focuses on Aerospace Sector

92MI0125 Rome SPAZIO INFORMAZIONI in Italian 9 Oct 91 pp 2-4

[Text] "The space sector must expand, both in terms of research and development and commercially," stated the managing director of Gilardini, Enrico Bondi, at a

meeting held in Colleferro (Rome) by the Italian Aerospace Journalists Association (UGAI), to present the Fiat Group's space activities.

"We intend to expand in the space sector," Bondi continued, "but this does not mean that we intend to convert our defense activities completely into the space sector. We are trying to proceed toward a guided reduction in defense activities, while space is an area where we expect future developments." Also participating at the meeting in Colleferro, the location of the BPD Spazio e Difesa [Space and Defense] plants, were Fiat Chairman Giuseppe Grande and the head of BPD's Space Division, Pier Giorgio Romiti.

Gilardini in Space

The meeting with UGAI journalists provided an opportunity to present the organizational chart of the space division of Gilardini's Space and Defense Systems [SDS] set up in 1990 as a joint venture to combine the defense and space activities of Snia BPD and Gilardini. The current organizational chart, according to SPAZIO INFORMAZIONI, shows the space division as being divided into two "industrial technology units" (the plants in Colleferro and Kourou in French Guyana, the latter being used by the Italian-French company Regulus) and into four product lines:

- 1. "Ariane" for the production of boosters and engines to separate the stages of the European carriers;
- 2. "Orbital Propulsion" for the propulsion and attitude control systems for satellites, platforms, and space stations;
- 3. "Small Launchers" for the development of the new San Marco Scout carrier and the design of its all-Italian replacement;
- 4. "Systems and Services" virtually corresponding to Fiat Spazio and comprising engineering studies and the supply of turnkey launch services.

The director of SDS's Space division is Mr. Grande, who is responsible for company strategies and is assisted by Romiti in operations. BPD and Fiat Spazio are part of this division and are also members of the Regulus, Arianespace Participation, Europropulsion, and Intospace consortia as well as CIRA, the Italian Aerospace Research Center. Overall revenues amount to around 150 billion lire per year, while employees number between 1,400 and 1,500. Including Fiat Avio and the Tecnospazio consortium (set up by Comau and Fiar), the overall "weight" of the Fiat group in the space sector can be summed up in an annual turnover approaching 200 billion lire and approximately 1,800 employees.

San Marco Scout and Other Projects

Confirmation was given at Colleferro that the project for the Italian-American San Marco Scout carrier designed by Professor Luigi Broglio and developed according to agreements between Snia BPD, La Sapienza University

in Rome, and the American company LTV, is now ready for final launching. "It should not be too difficult," said Romiti, "to finalize the program. We are waiting until the time is right. However, the combined skills of the company are all that is needed to develop the carrier with the exception of a few shortcomings, such as composite materials and guiding and control system, for which specific research programs are already underway." Grande emphasized that, "Our market survey predicts four to five launches a year for small applicational satellites. Therefore, together with the development of the San Marco Scout carrier, we also want to develop a standard carriage for mini-satellites which is not yet on the market and which can be fully developed within the Gilardini group." In response to a question by SPAZIO INFORMAZIONI, Grande revealed that the ejectable seat proposed by Fiat Spazio (according to an agreement with the Soviet company Zvezda) for the future European space shuttle Hermes, is currently being assessed at the French company Aerospatiale, while a contract with the ASI (Italian Space Agency) is being drawn up for research into a Mars rover for automatic exploration of that planet.

Sweden: Ericsson's Telecommunications Activities Assessed

*92WS0167J Maidenhead TELEFACTS in English
Oct 91 pp 13-17*

[Article: "LM Ericsson"]

[Text] International Strategy

In the 1970s, LM Ericsson built a global position in telecommunications by becoming the world leader in technology transfer. The company could plan, build, and operate a telecommunications equipment manufacturing plant anywhere in the third world in record time, building up local skills and "technology infrastructure."

A decade later, in the 1980s, Ericsson turned its focus to the richer markets of the first world in Europe and North America. It again used technology transfer to beat its competitors. The company grabbed a leading position in cellular, for instance, by transferring the technology from Nordic countries to the U.S.A.

In the 1990s, Ericsson is maintaining its position in PBX by transferring technology developed in the U.S.A. (in networking and data communications) to European markets. But Ericsson's biggest technology transfer gambit for the 1990s is its positioning as a "systems house" to sell advanced network support equipment to PTTs by packaging computers and software applications. Ericsson plans to transfer the latest computer and software technology from outside computer and software suppliers to the PTTs and to transfer "applications" technologies among its various customers.

Clearly Ericsson is carving out for itself a very special position in the public network market. It remains to be

seen whether the company can propel itself to the top of the market from this position.

If Ericsson manages to overcome certain development hurdles and continues to build on its new relationships in the U.S.A. and Europe, it could well meet its ambitious goals, particularly in public networks. In private networks, the company might still opt to withdraw, possibly via a joint venture, in order to concentrate on building its AXE digital switching system and cellular businesses.

International Focus

Participation in international markets has always been a key factor in Ericsson's success. In the early 1980s, for example, a large contract with Saudi Arabia launched Ericsson's new, unproven digital switching system, AXE. And the company's early experience in cellular in local Nordic markets paved the way for later success in the U.S. cellular market.

The dynamic works both ways: in the 1990s Ericsson's U.S. market participation is helping the company in its home markets. For example, its vertical market strategy in PBX, originally developed as a survival tactic in the U.S.A., is boosting the company's market share in Europe. Furthermore, the company's track record in the U.S. cellular market is helping Ericsson win contracts for new digital systems in Europe.

The U.S.A. is Ericsson's largest market outside Europe, accounting for 11 percent of 1990 sales. Mexico and Australia are also among Ericsson's top 10 markets, accounting for seven percent and five percent respectively in 1990 sales.

Private Networks

Ericsson's private network business is primarily European. Europe accounted for 72 percent of the company's Business Communications sales in 1990. Furthermore, it is in Europe that the company is experiencing its greatest growth. In 1990, PBX shipments actually declined in the U.S.A., Latin America, and Oceania.

For Ericsson, Australia, the U.S.A., and Mexico are its biggest Business Communications markets outside Europe. Activities in the U.S.A. are limited to selling the MD110 (mostly to universities and municipalities) and Eripix nodes to customers with international networks.

Ericsson hopes to become a major supplier of international corporate networks, but so far the company has managed to sign up only one major customer, Polaroid. Under an international master purchasing agreement, signed in 1990, Ericsson will supply equipment and service to Polaroid operations in 25 countries, including the U.S.A.

Other international activities in Business Communications include an agreement in 1990 for the local manufacture of the MD110 in China. In addition, an associated company in Brazil produces the MD110.

Public Networks

Ericsson's public network business is slightly less Europe-centered than its private network business. Europe accounted for 67 percent of BA Public telecommunications sales in 1990, but only 34 percent of BA Radio Communications sales. Radio Communications, since its joint venture with GE, has become the most international part of the company.

Ericsson's main goal in international markets is to obtain a 10 percent market share in the U.S.A., and within the next few years, the company might be able to bring this off. Ericsson currently features contract with five of the seven Regional Holding Companies (RHCs), including:

- US West, for Class 5 switches (local exchanges) and Signal Transfer Points (STPs). US West is one of Ericsson's first U.S. clients, having placed initial AXE orders in 1986.
- Ameritech, for Service Control Point (SCP) and Intelligent Network (IN) development. This deal is particularly significant because it will let the AXE SCP control advanced services for AT&T and Northern Telecom switches, and includes SMAS. Ameritech has stated that IN software and hardware development at Ericsson is the most advanced in the world.
- BellSouth, for STPs.
- Southwestern Bell, for Class 5 switches.
- NYNEX, for Class 5 and tandem switches. The NYNEX business includes a mass announcement switch for new voice information services and its first 1ESS replacement switch.

In addition, through its joint venture with GE, Ericsson is emerging as the top supplier for cellular systems in North America.

Elsewhere, Ericsson holds a leading position in Latin America. It is the leading supplier to TELMEX in Mexico. In 1990 TELMEX placed record orders with Ericsson for AXE, power equipment, and transmission equipment, including large quantities of fiber cable.

In Australia, despite the market entry of Alcatel with System 12, orders for AXE have held their own. In China, Ericsson remains one of the top suppliers, and the company recently broke into the highly protected Indian market with the sale of AXE international transit switches.

Other significant international operations include North Africa, the Middle East (especially Saudi Arabia), and Eastern Europe, where the company is emerging as the top supplier in Hungary. Ericsson is the top world supplier of cellular systems. The company has sold AXE-based systems in many countries where it has not sold other telecommunications products. Thus, with its highly successful cellular business, Ericsson is polishing its global image.

International Sales and Market Share

Private network sales in international markets totaled SEK 1,340 thousand million in 1990, down from SEK 1,470 thousand million in 1989. Ericsson's U.S. market share dipped below one percent in 1990, and shipments declined in the U.S.A., Latin America, and Oceania.

This does not mean, however, that Ericsson's international private network business is doomed. The company can still boast of an installed base in Latin America of more than one million lines, of which nearly one-third are MD110. Its market share in Latin America still approaches ten percent, and many of the region's major private networks are based on MD110.

In Asia, meanwhile, the MD110 has been installed—mostly in the government sector—in China, Hong Kong, Indonesia, Malaysia, the Philippines, South Korea, Singapore and Thailand. In Australia, Ericsson is a market leader; it supplied one of the country's largest private networks, a 15,000-line network for a bank. Customers in Thailand include the navy, the air force, and the police. Shipments to Asia are on the upswing.

Ericsson is also gaining share elsewhere: in Eastern Europe, Ericsson has scored some direct hits in Czechoslovakia, Poland, and the USSR. MD110 shipments in Eastern Europe grew from 33,000 to 56,000 lines from 1989 to 1990. In Africa and the Middle East, Ericsson's shipments are outpacing the market. Major projects in Africa include a private network for the Nigeria National Oil Company. In the Middle East, Ericsson is a key supplier to the Saudi Arabian government. Ericsson is a market leader in Kuwait as well.

In public networks, Ericsson's sales more than doubled from 1987 to 1990. Sales of Radio Communications equipment, which includes cellular, grew at an astonishing CAGR of 87 percent. Market share in cellular has remained stable at approximately 40 percent (for systems); it is the market as a whole that grew so rapidly, carrying all suppliers that could ride the wave. Ericsson's Cable and Networks business experienced strong growth in 1990 as the company acquired control of associated companies in Mexico and Brazil.

Australia is Ericsson's largest international AXE market, followed by Mexico. Other significant markets for AXE include South Korea, China, the U.S.A. and Brazil.

Ericsson's market share is highest in Australia (where competitor Alcatel makes the switch under license), Malaysia, Saudi Arabia, Venezuela and Mexico. In each of these countries, Ericsson accounts for more than 50 percent of shipments.

With the exception of Latin America, Ericsson's share on a regional basis is relatively low. North America leaves the most room for growth: the company's market share is two percent. In Asia and the Pacific, Ericsson's market

share is only nine percent; and the company has no appreciable share in more than half of the countries in this region.

Even in Africa and the Middle East, Ericsson's market share is a low five percent. This is because the company does not participate (at least for local switching) in three of the four largest markets in the region; Turkey, Egypt and South Africa. Only in Eastern Europe, where Ericsson commands 19 percent of the market, does its market share approach the level of Western Europe.

International Assessment

In private networks, Ericsson faces strong competition in most international markets. Superior marketing skills and long experience in local environments is no longer carrying the company through to success. Every battle is hard won.

Ericsson hopes to garner an overall third- or fourth-place world ranking in PBX. To attain this goal, the company will continue to try to gain share in the U.S.A. and other international markets.

Ericsson is fighting an up-hill battle. The company does not appear to have the skills to leverage its most valuable asset, its global presence. Ericsson's survival in the sector, however, is not in doubt: the company loses money only in the U.S.A. (like most U.S. market participants), and recent moves to rationalize development and consolidate manufacturing should further improve the company's cost position.

It is unlikely that Ericsson will retreat from the U.S. PBX market. Such a move would send the wrong signal to Ericsson's other, more important U.S. customers. Also, U.S. PBX market participation has helped the company's position in Europe, especially for vertical markets like education. Finally, by playing in the U.S.A., Ericsson stays at the forefront of private network technology.

In public networks, Ericsson's international position is quite strong. An early lead in cellular has brought in new clients for other AXE applications, especially in the U.S.A. The company is well positioned to reach its 10 percent U.S. market share goal.

Ericsson also has a good chance to obtain an even higher share of the U.S. market in the future. The U.S. market has a structural flaw. The RHCs' biggest supplier, AT&T, is also their biggest competitor. Until AT&T divests its equipment group, this contradiction will remain, and as long as it remains, the RHCs will have a good reason to cultivate alternative suppliers.

Until now, AT&T's position has been protected by its superior technology and Bell system knowledge. However, like Northern Telecom, Ericsson is catching up. The 1ESS switching system and an integrated transmission product line with complete operations and maintenance systems have been AT&T's fortresses against competitive onslaught. In the past, few competitors could meet 1ESS processing power and functionality, or

AT&T's operations and maintenance systems (Bell System standard). Now Ericsson is doing both. Furthermore, to differentiate itself from Northern Telecom, which is becoming a fortress in itself in the U.S. central office (CO) market because of its close ties with the RHCs, Ericsson is trying to set the pace of IN and new services development.

Success in the U.S.A. will contribute to continued success in Europe as Ericsson transfers technology developed by the demanding RHCs in the U.S.A. to PTTs in Europe. If Ericsson continues to build market share in the U.S.A., the company will have a fair shot at reaching its goal of becoming the top digital central switch supplier in the world by 1996.

European Strategy

Ericsson's four largest markets—Italy, Sweden, Spain and the U.K.—are in Europe. Of Ericsson's top ten markets, seven are in Europe, and five are EC members. These seven markets account for 56 percent of Ericsson's total sales. Overall, Europe accounts for almost 59 percent of sales.

In 1990, Italy surpassed Sweden as Ericsson's single largest market. This does not lessen the importance of the Swedish domestic market for Ericsson. In Sweden, Ericsson and Televerket, the Swedish PTT, jointly own an R&D company, ELLEMTEL, which developed the AXE switch and the MD110 PBX system. ELLEMTEL continues to develop core systems of both products, while Ericsson is responsible for country adaptations other than Sweden.

The ELLEMTEL joint venture is similar to Bell Northern Research (BNR), the R&D company jointly owned by the telecommunications company Bell Canada and the equipment supplier Northern Telecom Ltd. in Canada. The Bell Canada/BNR/Northern Telecom trio differs, however, in that Bell Canada owns a controlling interest in Northern Telecom, and thus BNR is a joint venture between a parent company (Bell Canada) and its subsidiary (Northern Telecom).

However, in two essential aspects BNR and ELLEMTEL are alike: both represent an R&D joint venture between an equipment manufacturer and an operating company; and both have contributed enormously to the success of the equipment suppliers involved.

Ericsson's relationship with Televerket, the Swedish PTT, is getting closer. In 1990, Televerket purchased Ericsson Sverige AB, Ericsson's Swedish sales company. Televerket is moving toward full responsibility for Ericsson's main product lines in the Swedish market. Televerket is thus taking care of the home front, letting Ericsson concentrate on conquests overseas.

Because of the Ericsson Sverige AB divestiture, Sweden appears to be a less important market for Ericsson, dipping from accounting for 16 percent of the company's sales in 1989 to only 12 percent in 1990. In reality, Sweden is as important as ever, but market participation

has taken a slightly different form. Sweden remains Ericsson's second largest market, after Italy and followed closely by the U.K. and Spain.

European Private Networks

Ericsson's biggest markets for private network equipment in Europe are Sweden, the U.K., Italy and Spain. Other important markets include the Netherlands, Finland and Norway. The company's market share varies widely by country, from 50 percent in Spain to five percent in the U.K.

Ericsson is clearly trying to boost its share of Europe's largest markets—especially in Germany, Italy and the U.K. A major effort to grab a significant share of the French market is anticipated. Ericsson is attacking on two fronts: first, it is pursuing a precise vertical market strategy, targeting universities, municipalities, the financial sector and industry; and second, Ericsson has a distribution strategy designed to maximize sales potential in each country. Channels include PTTs, direct sales, and licensees and joint ventures.

In contrast to its competitors Siemens and Alcatel, Ericsson sells a single system, the MD110, in all country markets. As production is concentrated in one or two factories, the company's cost position will be second to none. Furthermore, Ericsson's vertical market strategy is working, and the company is applying its vertical market expertise across borders.

Ericsson's weaknesses in Europe include its lack of a significant presence in France. Without a firm French presence, Ericsson will be hard pressed to serve "pan-European" clients in the single European market of 1993. Also, PTT distribution in Sweden, Norway, Denmark, the Netherlands, and Spain limits aftermarket opportunities, as do license agreements in Yugoslavia (Nicola Tesla) and Switzerland (ASCOM). Schrack in Austria is also a licensee, but Ericsson bought a significant share of the company in 1991.

Ericsson's sales of data communications equipment are concentrated in Europe, and especially in the Nordic countries. The Eripac packet switching system is, however, beginning to obtain significant market share in Italy and Germany.

European Public Networks

Ericsson is one of the big three public network equipment suppliers in Europe. In terms of 1990 digital local lines placed in service, Ericsson ranks second only to Alcatel. Siemens ranks third, but would move into second place if GPT operations were included fully. The biggest AXE markets in Europe are the U.K., Italy, Spain and Sweden.

Ericsson wants to build further market share in switching, as well as in parallel non-wire markets, transmission, and network management. Germany, the second-largest market in Europe after the U.K., is Ericsson's main target for expansion.

The company no longer builds local plants as a market entry strategy, but local R&D centers instead. Thus, to build market share in Germany, the company is building a major R&D center in Aachen. A major facility was built in the Netherlands as well, where the company is also building market share. Ericsson's basic game plan is to build share by building strong local companies, and to leverage its diverse products lines (cellular, public switches, DXC) to gain share across several sectors.

By forging strong local companies within the EC, Ericsson, a Swedish company, has managed to become an EC insider company, even though Sweden is not yet a member of the EC. This is quite an accomplishment, considering the fact that EC politicians are constantly revising policy toward non-EC companies. IBM, a company with far greater lobbying resources than Ericsson, finds itself constantly maneuvering to maintain an EC identity card.

And the risks of rejection are real: after being acquired by a non-EC company, U.K.-based ICL was ejected from many European programs.

European Sales and Market Share

Ericsson's sales in Europe have grown from SEK 15,000 million in 1987 to SEK 25,000 million in 1990. While total Business Communications sales figures were flat in 1990 because of the divestiture of the Swedish sales operation, shipments of the MD110 increased from 474,000 to 576,000 lines. In public networks, both Radio Communications and Public Telecommunications showed strong growth. The Cable and Networks Business Area has yet to recover its 1988 sales peak.

Overall, Ericsson holds about nine percent of the PBX market in Western Europe. This places the company in fourth place behind Alcatel, Siemens, and Bosch. Market share varies widely by country, ranging from seven percent in the U.K. to 50 percent in the Netherlands. Spain is another important market; Ericsson controls 100 percent of the Ibercom digital service market (an "overlay" network built by the PTT with Ericsson AXE and MD110s for business services) and 50 percent of the overall PBX market. In Italy, Ericsson has some 20 percent of the PBX market, in Finland 44 percent.

In public switching, Ericsson holds an overall share of 20 percent; the company's single largest market in switching is the U.K., where its market share is 20 percent and stable. The next largest market is Italy, where market share is 27 percent and growing. Spain is Ericsson's third-largest market in Europe. In Spain, the company has cornered 47 percent of the market and its share is expanding. Other important markets include Denmark, the Netherlands, Sweden, Finland, and Switzerland. In 1990, Ericsson was chosen to replace Alcatel as the main national supplier in Norway.

European Strategy and Assessment

Ericsson is extremely well entrenched in Europe. In recent years, the company has won large public switching

contracts in Europe against fierce competition from local suppliers Siemens and Alcatel and new entrants Northern Telecom and AT&T. In the U.K., Ericsson beat Northern Telecom and Alcatel to become British Telecom's second supplier. In France, Ericsson bested Siemens and AT&T to become France Telecom's second supplier, and in Spain and the Netherlands, where Ericsson faces new entrant AT&T directly, Ericsson continues to gain market share.

In 1990, Ericsson signed a frame contract for switch deliveries through 1992 and product development through the 1990s with British Telecom. The company has joint development projects running with PTTs in Sweden, Spain, and the Netherlands.

GSM digital cellular networks, which will be introduced in many European countries starting in 1992, will further boost Ericsson's European business. Already, operators in the U.K., France, Germany, Switzerland, Spain, Italy, Sweden, Denmark, and Finland have chosen Ericsson as a GSM system supplier.

The introduction of GSM will trigger a market boom in cellular in Europe, since many PTTs have been holding back on cellular deployment while waiting for the new digital GSM technology to be fully developed.

Several factors are key in Ericsson's success in Europe. One of the most important is probably price leadership. In spite of the technology race, there are few performance issues at stake; the question is whether or not a country adaptation is available, and if not, how long it would take to build one.

Another prime factor is Ericsson's negotiating skill, its ability to understand its customers and the political environment in which they operate. The company knows what issues to push and when—and perhaps more importantly, it knows what issues to avoid and how to avoid them. In France, Ericsson simply stood aside and watched AT&T and Siemens eliminate each other, then stepped in to pick up the winnings (CGCT and a guaranteed 16 percent share of the French CO switching market).

Ericsson wants to grow more in Europe, and views its single biggest opportunity as Germany. There, the company is successfully building market share in private networks, winning a major bid to equip a new cellular network (Mannesman Mobilfunk), and is currently under contract to supply the PTT with sophisticated DXCs through the Flexnode consortium.

The Flexnode consortium, which includes German partners DeTeWe and Fuba Communications, will leave Ericsson in a good position to bid on Deutsche Telekom's next public switching frame contract in 1992-1993. DeTeWe, which currently manufactures Siemens' EWS central office switch for the PTT under a license agreement, could team up with Ericsson for the next round of bidding.

In private networks, Ericsson continues to build share in Germany and the U.K., despite fierce competition and price wars. The company is likely to be able to sustain its position, and perhaps even improve it, as the company consolidates manufacturing plants and brings out new vertical market packages and add-ons, such as cordless telephones.

Ericsson would also like to enter the French PBX market. It would make sense to enter the market via its public switching joint venture partner, Matra. But Matra has its own line of PBXs and international ambitions, despite the fact that the company is probably too small to survive in the international PBX market in the long term. Ericsson could be waiting for Matra to throw in the towel in PBXs, but it could be a long wait. Matra has picked up lucrative PBX supply contracts with the French PTT, and recently purchased the second-rank U.S. supplier, InteCom.

Overall, Ericsson's European position is an enviable one: the company is under threat nowhere—and is poised for growth in several major markets, particularly Radio Communications equipment (cellular), followed by Public Telecommunications and Cable and Networks.

EAST-WEST RELATIONS

Siemens, Framatome Buy Shares in Czechoslovakia's Skoda

92WS0218B Paris *L'USINE NOUVELLE*
in French 5 Dec 91 p 47

[Article by Jean-Pierre Gaudard: "Framatome Sharing in Siemens Baggage"; first paragraph is *L'USINE NOUVELLE* introduction]

[Text] In acquiring 10 percent of the Czechoslovak firm, 57 percent of which will be owned by Siemens, Framatome [Franco-American Nuclear Construction Company] hopes to profit from a possible livening up of the East European nuclear energy sector.

A new German success in Czechoslovakia. Siemens will take over Skoda's electrical energy and construction activities. The German group will acquire 67 percent of the new company, Skoda Energo, to be set up next April, and will sell 10 percent of it back to its French ally Framatome.

Siemens, the heir to an oversized industrial machinery after the collapse of the East European markets, was the winner over Westinghouse, which had withdrawn its offer, and ABB [Swedish General Electric Corporation-Brown Boveri group]. Its strong suit was Bohemia's historic proximity. After all Munich, Siemens' base, is only 200 kilometers from Pilsen, the site of Skoda Energo's huge installations.

A source close to the proceeding deems that "Siemens, facing strong demand in some fields, such as gas turbines, has sufficient work for Skoda. And the proximity

of the factories of the two groups to each other will facilitate their industrial integration."

To boot, Siemens also had the advantage of a strong political card: Framatome's presence in the overall operation. But Framatome, playing the role as it were of a simple shareholder, will not draw the full benefits of its presence immediately. It is presently consolidating its nuclear alliance here with KWU, Siemens's electrical construction subsidiary, among the NPI's [Newly Industrialized Countries].

The new joint company is a candidate for possible future nuclear power station construction projects in Czechoslovakia and Hungary. The message is clear: In the event of an order, Skoda, which already has nuclear engineering and construction know-how—in Soviet technology, of course—will be automatically included in the contract. If the nuclear sector gets going again, Framatome sources add, "We may well witness a shake-out and streamlining of manufacturing firms in the European context."

In taking over Skoda, the Siemens-Framatome team has taken a substantial lead in the race for nuclear orders, but there is nothing to say that the economic and political conditions for a Czechoslovak order will be met soon. And Westinghouse is not out of the running yet. The U.S. firm has just signed an agreement for the development of a fuel for the Temelin nuclear power station (South Bohemia). Its partner: Skoda Pilsen.

Siemens, Skoda Set Up Joint Venture in Energy
92P60087 Duesseldorf *HANDELSBLATT* in German
27 Nov 91 p 26

[Text] The Siemens division of KWU has agreed in principle with the Skoda company of Plzen A.S. and Skoda Praha A.S. to establish a joint venture for the entire field of energy generation. Such an agreement was signed in Plzen, but it still requires the approval of the government of the Czech republic. The planned joint venture intends to offer fossil fuel and nuclear power plants, hydroelectric generators and also modern environmental protection technology for power plants and waste disposal facilities. Thus it will furnish a complete spectrum of products, from development and planning to the delivery of turnkey operations.

The working name for the new company is Skoda Energy. Skoda will take 33 percent of the capital and Siemens/KWU will take 67 percent. According to information from Munich, the share which Siemens will take will also provide for participation by the French reactor manufacturer Framatome, with whom Siemens/KWU has been cooperating in reactor construction since 1989.

From this cooperation, Skoda is hoping for assistance in the task of bringing the northern Bohemian power plants up to the necessary level of environmental technology and in other urgent environmental problems of the CSFR.

Siemens was chosen as the strategic partner for developing the energy business, it is said, because the company, along with Framatome, provides the best qualifications for power plant business on the world class level in the area of nuclear equipment. For Siemens, the cooperation with Skoda is a considerable increase of its involvement in energy technology, not only in Central and East Europe. With this "solid partner" one can tackle larger deals on the world market. During many years of business dealings, one has become convinced of the high technological level of Skoda and the qualifications of its employees, it is said. The predominant share of the management for the joint venture will come from Skoda. The installations and funds to be supplied, as well as the number of personnel, are to be regulated in the coming months. Skoda Plzen was founded in 1859 and is one of the world's most important manufacturers of power plants. The company has a leading position in East Europe in the construction of both conventional and nuclear power plants. Over 7000 persons are employed in Plzen and Prague in the area of energy production.

Germany: Daimler-Benz Signs Vehicle Accord in Russia

92WS02080 Brussels *EUROPE* in English
25-26 Nov 91 p 18

[Article: "(EU) Daimler-Benz: Industrial Projects in Russia"]

[Text] Car Industry

The German group Daimler-Benz (Stuttgart) is to manufacture utility vehicles in Russia of the Unimog type, according to a letter of intent signed in Moscow by Boris Yeltsin and Mr. Edzard Reuter, president of the German group. The latter considers as a realist objective the building of between 10,000 and 12,000 vehicles a year which will mainly be used in agriculture.

Russia also wants to cooperate with Daimler-Benz in the production of buses. In this field, the German group will cooperate with AVTROKON with which it has had ties since November 1990 through a licensing agreement. A factory with a 2500 a year bus capacity will be built in Moscow. Daimler-Benz should also supply spare-parts for the buses of the Hungarian firm IKARUS: of the 100,000 IKARUS buses in Russia, half of them are laid up because of the lack of spare-parts, IKARUS having ceased production. Cooperation could extend to the production of ambulances that so far have been built in the Baltic States. Other projects concern the AEG [General Electric Society] and DASA [Deutsche Aerospace] divisions of the German group.

EUROPE-ASIA RELATIONS

New Sulzer Diesel Increases Sales to China
92WS0202C Paris *L'USINE NOUVELLE* in French
28 Nov 91 p 44

[Article by Xavier Debontride: "New Sulzer Diesel France Turns On the Gas in Asia"; first paragraph is *L'USINE NOUVELLE* introduction]

[Text] The world leader in generating stations, which has orders of 1.5 billion French francs [Fr] this year, is strengthening its penetration of Asian markets.

China is more than ever the top market of New Sulzer Diesel France. The world's top builder of diesel generating stations distributes more than 40 percent of its production in the Canton region. And last week its CEO Bertrand Martin signed an approximately Fr150 million order with the city of Guizhou to deliver five 55 MW [milliwatts] generator sets.

The contract boosts orders to nearly Fr1.5 billion this year, an increase of 60 percent over the last fiscal year. "Our breakeven point is 750 million in orders. With current orders, the next two years will be very positive, and our turnover has already been substantially realized for 1993," stresses Bertrand Martin, who makes 98 percent of his sales from exports.

His group employs 370 workers, but fresh hiring to meet the demand has not been ruled out. Bertrand Martin is also expecting improved profits (Fr3 million in 1990). This should satisfy his German-Italian shareholders, who have had a controlling interest in his parent company located in Switzerland since July, 1989. Indeed, the Italian shipyards Fincantieri (a subsidiary of the public group IRI) and the German consortium made up of the Bremer Vulkan and Deutsche Maschinen und Schiffbau shipyards each hold 42 percent of New Sulzer Diesel Ltd.'s capital. The remainder is controlled by the Sulzer Freres group and management. It is a group of shareholders whose interest is more financial than industrial, giving the French subsidiary full latitude to sell its power stations throughout the world.

French Technology Firm, Chinese Chemical Institute Sign Research Cooperation Agreement

92WS0169D Paris *LE MONDE* in French
23 Nov 91 p 28

[Text] Montecatini Tecnologie (of the Ferruzzi-Montedison group) signed an agreement with a Peking chemical institute concerning several joint research projects to develop new chemicals, petrochemicals, and plastics. The agreement also provides for the development of new technological processes that are environmentally safe. It was signed with the Beijing Research Institute of Chemical Industry (BRICI), a Peking research institute that falls under the jurisdiction of the Chemical Industry Ministry. Montecatini Tecnologie and BRICI will share research expenses and will jointly own the technological innovations they develop.

Merlin Gerin To Build Inverter Factory in Asia

92WS0202A Paris *L'USINE NOUVELLE*
in French 28 Nov 91 p 44

[Article by Marc Nexon: "Merlin Gerin Shores Up Its Leadership in Inverters"; first paragraph is *L'USINE NOUVELLE* introduction]

[Text] The market is depressed, and the firm is attacking foreign markets.

When you are the top inverter company in the world, it is hard to stay out of one of the globe's three biggest markets—Asia—for long. Merlin Gerin (Schneider group) has decided to correct this anomaly by forming industrial alliances with local manufacturers.

The Grenoble manufacturer makes 2 billion French francs [Fr] from inverters (10 percent of its total sales), and plans to take the initiative in a region that is dominated by the Japanese (Mitsubishi, Toshiba, Nec) and besieged by its American rivals such as Emerson (second internationally) and Chloride. The latter two are installed in Hong Kong and Thailand respectively.

There is nothing coincidental about the timing of the offensive. Indeed, inverters (electrical protection power supplies) are 80 percent dependent on data processing, a sector that is in the midst of a slump. Although the inverters market was flirting with growth of 15 percent two years ago, it will not grow more than five percent this year. Anxious to hold on to its leadership position with 12 percent of the market, Merlin Gerin, which already sells large inverters in Southeast Asia, has decided to build a factory there. The move will enable the firm to shore up its two existing industrial concentrations. The first, in France, boasts two factories, one in Grenoble (inverters with over 3 kVA) and another in Privas (small inverters). The second is in the United States and consists of EPE Technologies, which was acquired in March of 1990, and Topaz, which came in the basket of the Square D group that Schneider acquired. The two concerns located near Los Angeles should enable Merlin Gerin, which ranks fourth in the American market, to recover some lost ground vis-a-vis its competitors.

Panasonic To Enter European Mobile Phone Market

92WS0241 Duesseldorf *HANDELSBLATT* in German
24 Dec 91 p 9

[Article: "Entry Into the Mobile Telephone Market: Panasonic: Marketing via D-Network Service Firms"]

[Text] Panasonic, a subsidiary of the Japanese Matsushita Group, which will record a 1991 turnover of nearly \$47 billion, is familiar to most Germans as a manufacturer of home entertainment electronics such as video recorders. Now that the digital D-Network has been established under the European GSM-Standard (Groupe Speciale Mobile), Panasonic also wants to make inroads into the German mobile telephone market.

The Japanese objective for this market is ambitious: "We would like 20 percent of the market," states Detlev Driemeier, Panasonic marketing director. Other manufacturers such as Siemens and Alcatel have more modest aspirations - "at least 10 percent" - for a Pan-European market, which is expected to number between 20 and 25 million units by the year 2000.

The Japanese are no strangers to the mobile telephone industry: They control between 10 and 20 percent of the mobile telephone market in the United States as well as in Great Britain, Scandinavia, and Switzerland, where mobile telephones must comply with TACS (Total Access Communications System) and NMT (Nordic Mobile Telephone) standards. In contrast to this, the small market volume represented by the strictly German C-Network has kept Panasonic out of the German mobile telephone market.

The component-giant Matsushita established a strategic alliance with the British telecommunications firm Orbitel in the field of digital car phones, which are developed and produced in Great Britain. As part of the alliance, the two firms collaborated to produce a chip connector circuit for GSM telephones. The large combined market volume of the two manufacturers is expected to ensure a more rapid recovery of their investment costs. Nonetheless, from this point on, the Japanese want to develop the chip connector circuits for second-generation mobile telephones independently. The production of GSM appliances will be tailored to market conditions. However, according to Panasonic, the initial production output will total 15,000 units per month.

Astonishingly, in contrast to home entertainment appliances, Panasonic does not intend to sell its D-Network car phones on the open market, but rather to sell them to well-established dealers. Consequently, the Japanese have for now ruled out product marketing aimed at the private final consumer. However, according to Driemeier, this is subject to change.

The car phones are to be marketed exclusively via a few service firms. As private mobile telephone corporations acting for D1 (the postal enterprise Telekom) and D2 (Mannesmann Mobilfunk), these firms take full responsibility for soliciting subscribers for their networks. In the meantime, the question of how Panasonic expects to win 20 percent of the market using this approach remains unanswered. After all, the telephones are currently priced at 4,500 German marks.

L'Air Liquide to Expand Activities in Thailand

92WS0202B Paris *L'USINE NOUVELLE* in French
28 Nov 91 p 44

[Article by Xavier Debontride: "L'Air Liquide Redis-
covers Thailand"; first paragraph is *L'USINE NOU-
VELLE* introduction]

[Text] A few weeks after announcing it would create a Franco-Thai innovation center in Bangkok, the specialist in industrial gases is signing several contracts for industrial operations in the peninsula.

After a thirty-year absence, L'Air Liquide is returning to the Thai market. Its "ad hoc" Asian subsidiary SOAEO (Far Eastern Oxygen and Acetylene Company) was just selected last week by an American-Thai consortium to

construct a gas-production plant north of Bangkok. The plant will be up and running in a year and will supply power to a float-glass factory held as a joint venture by the American glass group Guardian and the Thai conglomerate Siam Cement. Siam Cement has also been Michelin's industrial partner in the region for three years.

The contract, whose value was not disclosed, also gives the group the chance to open a gas storage and distribution center for the local market next June. It will be located near the future factory. And L'Air Liquide's subsidiary SAF [Soudure Autogene Francaise] has just signed a joint-venture agreement with a Thai partner to market and maintain welding equipment effective January. The company's return began in 1989 when it reopened a representation bureau (the group was active in Bangkok from 1928 to 1962). Its first major move was to create the Franco-Thai French Center for Innovation, a cultural and scientific cooperation project costing 23.5 million French francs that is being carried out in collaboration with government authorities, the Federation of Mechanical Industries, France Didac, and a group of French companies. "We wanted to set ourselves apart from very strong international competition by taking an educational approach to the market," explains Helene Farny, international director of the group's equipment division and the Center's linchpin. The Center will welcome its first classes for training in French technologies next June, in an attempt to alleviate part of the country's shortage of skilled personnel. The shortfall is estimated at 500 engineers and 20,000 technicians a year. Helene Farny describes this as an illustration of "the third type of exporting." Her strategy is based on showcasing know-how, an ongoing presence in the country through trainers, and partnership, since L'Air Liquide is supporting in this operation small and medium businesses that are still inexperienced at exporting.

France's Atochem To Open Chemical R&D Center in Japan

92WS0144B Paris *AFP SCIENCES* in French
24 Oct 91 pp 28, 29

[Text] Tokyo—The French chemical firm Atochem, a subsidiary of the Elf-Aquitaine petroleum group, plans to open a research & development technical center in Japan shortly, announced its CEO, Mr. Jacques Puechal, 18 October in Tokyo. The purpose of the center will be to strengthen the company's position in Japan and bring it closer to the immediate needs of its Asian customers.

"The goal is to shorten the interval between Japanese client requests and actual product delivery, through research that is adapted to local needs," explained Mr. Puechal to the press. He noted that the technical center, which will be located in Kyoto, will be operational at the beginning of 1993. Atochem, which employs 2,500

research & development people worldwide, already utilizes foreign technical centers in Germany, Italy, and the United States.

But the Japanese market, which is primarily interested in Atochem's plastics, is gaining in importance for the company. Installed in the archipelago since 1985, Atochem will derive some 38 billion yen in revenues (about 1.75 billion French francs) from Japan in 1992, or about five times the 1990 level. The French firm is already involved in 10 partnership agreements there with Japanese companies and has sold ten exclusive licenses.

France's SGN, Japan's MHI Form Joint Venture

92WS0256C Paris AFP SCIENCES in French
12 Dec 91 p 22

[Article: "Nuclear Industry: Franco-Japanese Joint Venture RECO Formed"]

[Text] Paris—France's engineering group SGN and Japan's MHI [Mitsubishi Heavy Industries] have formed a company, RECO, under Japanese law, according to an SGN announcement on 9 December. The new company is owned 50 percent by SGN and 50 percent by MHI.

With its head office in Tokyo, RECO has as its purpose, according to the SGN announcement, "the commercializing of specific equipment for nuclear fuel cycle terminal installations, and particularly for the future Rokkasho-Mura (northern Japan) reprocessing plant. The specific equipment involved was originally designed for The Hague's UP3 plant.

SGN is staffed by 2,200 salaried employees and had a consolidated revenue of 2.3 billion francs in 1990. It has maintained a presence in Japan since 1965, and has installed a subsidiary there: SGN Co. Ltd. In 1987, it signed a technological cooperation agreement with Japan Nuclear Fuel Services for the design and construction of the Rokkasho-Mura reprocessing plant. Another study contract was signed in 1989.

Asian Investment in East Europe Analyzed

92WS0208B London INTERNATIONAL
MANAGEMENT in English Nov 91 pp 48-51

[Article by Jane Sasseen: "Japan Takes It Gently"; first paragraph is INTERNATIONAL MANAGEMENT introduction]

[Text] The Japanese have designs of their own on eastern Europe, even though they have not joined in the west's investment rush. Like the South Koreans, they plan to sell, sell, sell.

As the global race for joint ventures with east European companies took off, one country that might have been expected to run neck and neck with its competitors was absent. While other runners are gathering momentum Japan is only now getting to the starting blocks.

Japanese vehicle manufacturer Suzuki this year agreed to invest \$40 million (33.3 million European currency units) in a Hungarian car plant; Asahi Glass indirectly controls Czech glassmaker Glavunion, but management of the venture is in the hands of its Belgian subsidiary, Glaverbel; trading groups Mitsui and Mitsubishi have formed a consortium with Switzerland-based Asea Brown Boveri and Finnish oil producer Neste that is negotiating to build a Siberian petrochemicals plant.

But these are exceptions—and most Japanese companies are keeping their distance. Despite a trip to Tokyo by Birgit Breuel, president of the east German Treuhandanstalt, electronics company MEI has been the only Japanese concern to sign a letter of intent to buy a former east German operation. Hungary boasts more than 9,000 joint ventures—just 12 come from Japan. Fewer than 10 of the more than 3,000 Polish joint ventures are Japanese. The slow pace of change in Czechoslovakia and a long-running dispute with the Soviet Union over the Kurile Islands have deterred Japan from greater involvement in these countries also. "It's far too early to even think about east European investment," says a high-ranking executive at electronics maker Panasonic. "It will be years before the markets and the infrastructure have developed enough to make it worthwhile."

After the fall of the Berlin Wall analysts predicted that east European countries would see an investment rush by Japanese companies eager to set up low-cost production sites in the region. Instead, they have been welcoming Japanese delegations on fact-finding missions. "Japanese firms continue to look at eastern European with extreme caution," says Masahiko Agata, head of the London office of the government-owned Export-Import Bank. "Most want to see the basic infrastructure in place and the economic climate improve before they will consider putting money into these countries."

The current uncertainties in the east have worried Japanese companies far more than their European and North American competitors. "Japanese firms are ill at ease in unstable situations. They don't like unpredictability," says Jacques Gravereau, head of the Eurasia Institute at French business school HEC. Cultural differences, language difficulties and the lack of historical ties with the region prove further handicaps. "Japanese business circles don't have any clear image of eastern Europe and its role in Europe's future," says Hattori Michitaka, an analyst with the Japan Association for Trade with the Soviet Union and Central-Eastern Europe. Already preoccupied with the effort and expense of investing in western Europe's far more lucrative markets, most have decided eastern Europe can wait.

But any west European executive who thinks that European companies will have the potentially profitable markets in their eastern backyard to themselves had best think again.

Lack of investment does not equal lack of interest; instead, Japanese companies have approached eastern

Europe with a markedly different strategy from their west European counterparts.

Japanese companies in sectors such as electronics, telecommunications and cars are targeting the newly opened east for a hefty increase in exports. They have put together long-term strategies based on building the sales offices and distribution networks needed to acquire a big share of markets as the eastern economies develop. "In the long run, most Japanese executives think they can make good profits in eastern Europe without a big investment," HEC's Gravereau says. "All their energies today are going into building their commercial operations."

Japanese efforts have already begun to pay off. Though the lack of hard currency sent Japanese exports to the Soviet Union tumbling 17% in 1990 to \$2.6 billion, shipments elsewhere have soared. Japanese exports to Poland rose 54% to \$308 million in 1990 and almost doubled again in the first half of 1991. Shipments to Hungary rose 31% in 1990 to \$143 million, with another 13% gain to the end of May. Over the same period, Czechoslovakia's tiny export market jumped 64%, while shipments to Yugoslavia soared 86% to \$114 million.

Altogether, Japanese exports to eastern Europe rose 26% to reach almost \$1 billion in 1990, jumping another 43% in the first five months of 1991.

Nowhere is the difference in strategy between the Japanese and their western competitors clearer than in the vehicle industry. European-based companies have fallen over one another to invest in east European production. Volkswagen, GM and Fiat have all signed deals, while Renault would like to. Building low-cost products for export to western Europe is one goal, but most also believe that producing locally will be necessary to grab and maintain market share. "To succeed in eastern Europe, we've got to invest there," says Thomas Mason, GM Europe's head of marketing.

Japanese manufacturers appear unconvinced. Apart from Suzuki—which, having spent six years negotiating its deal to assemble 15,000 cars annually in Hungary, was not motivated by the current upheavals—Japanese car makers have shown little interest in eastward investment. "We're not planning any production whatsoever in eastern Europe," says Nissan Europe executive Han Tjan. "A strong national market is key to setting up production, and eastern Europe is far from reaching that point." Officials at Toyota repeat the message.

Instead, both are concentrating on building local sales networks in the new markets. Toyota has announced plans to increase its distributorships in eastern Germany and Poland, while Nissan is building its own network in those countries as well as in Czechoslovakia and Yugoslavia. The failure of most Japanese car manufacturers to benefit significantly from the east German boom in car-buying demonstrates the need to expand their networks. Demand for new and used cars among east Europeans caused pan-German car sales to jump 33% in

the first seven months of this year. Nissan, with 56% growth, was the only Japanese car maker to take advantage of the boom. Toyota, Mazda and Suzuki together averaged just 10% growth.

But GM's Mason is under no illusion that the slow performance so far reflects lack of interest. "There's no doubt the Japanese will be very big players throughout Germany and in the eastern European markets now opening," he says. "They may have missed the current boom, but they won't miss the next."

Nor will aggressive South Korean carmakers such as Hyundai and Daewoo. Hyundai has built the beginnings of a network in Yugoslavia, Poland and Hungary, and began distributing in Germany for the first time early this year. Pre-unification plans for the first year targeted 80 dealerships, but by September Hyundai boasted 140 dealers, including 45 in the east. With prices running well below those of European and Japanese makes, Hyundai is counting on value-for-money tactics to attract car buyers in the east.

These tactics have speeded South Korea's giant *chaebol* conglomerates, groups such as Daewoo, Lucky Goldstar and Samsung, in their penetration of east European markets. Koreans are catching up with Japanese companies, in some cases overtaking them, even though Japan's major trading companies opened offices in eastern Europe in the 1970s while most Korean companies began trading there only after diplomatic relations were restored in 1989.

South Korea's exports to Yugoslavia rocketed to \$214 million in 1990 from just \$47 million in 1989. Altogether, shipments to eastern Europe more than doubled in 1990, hitting \$519 million in the Soviet Union and \$509 million for the rest of the region.

Between them, Japanese and Korean exporters appear to have sewn up the electronics market. Pent-up demand for colour televisions, stereo systems, videos and fax machines creates market opportunities that East Asian manufacturers swiftly exploit. Panasonic has seen east European turnover rise 30% annually since 1988 to \$250 million in 1991; the company predicts that by 1994 exports will have doubled. Lucky Goldstar expects to export 450,000 TV's and video recorders to eastern Europe this year, while Samsung boasts a similar performance. "There are now whole categories of electronics products where the Japanese and Koreans hold a virtual monopoly in the east," says Ivan Botskar, publisher of *Japaninfo*, a German newsletter. "They've got smaller, better priced products that are more attuned to the markets than their western European or American competitors."

For many popular consumer electronics items, Botskar predicts the Koreans will prove particularly well positioned to take advantage of the developing eastern markets. While Japanese producers have moved increasingly upscale to meet the sophisticated demands of their

worldwide customers, the Koreans now dominate a lower-end niche offering reasonable quality goods at significantly cheaper prices.

Over the past year Daewoo, Samsung and Lucky Goldstar have been quick to pour money into advertising to build recognition of their value-oriented brands in the east. All are betting that the combination will prove better suited to eastern Europe's price-sensitive markets.

"These countries don't need high-tech design, they need reliable products at reasonable prices," says Sang Duk Oh, managing director of Lucky Goldstar International in Germany. "We will have an advantage over Japan because Korean products are much closer to the needs of the eastern markets."

If colour TV's and videos have sold themselves, efforts by Japanese and South Korean computer makers to boost sales have taken effect slowly. Restrictions in the past on the export of high-tech goods to communist countries means sales networks have to be built from scratch. Ironically, both countries are being undercut by aggressive makers from Taiwan, Singapore and China. They have a tight grip on the existing business because they were not party to the Cocom export restrictions and their rock-bottom prices make them difficult to beat.

"The market will develop in a few years, but for now people just want the most for their money," says Norbert Braun, head of east European sales for computer and printer maker Epson. "Price is far more important than quality."

Korean competitiveness is based far more on price than is Japanese. This not only gives Korean exporters an edge over Japanese competitors, it means that Korean conglomerates are likely to be far quicker to risk investing in low-cost east European production once the political and economic clouds disperse.

Already, Samsung has set up a joint venture to assemble televisions in Hungary, while Lucky Goldstar is negotiating deals to build colour sets in Poland, Hungary and Czechoslovakia. Though initially intended to meet high local demand, "as production quality rises, we would like to use our eastern European production to penetrate the western markets," says Byung Soo Oh, head of Lucky Goldstar's Austrian office.

Less demanding technology also makes Korean production better suited to the east European labour force than many of Japan's state-of-the-art techniques.

With Japanese manufacturers preoccupied with investments in western Europe and less dependent on price for their competitiveness, few expect to see significant Japanese investment soon. "Japanese companies will wait to see what happens to western European investments," says the Export-Import Bank's Agata. Most will also wait to see how the association agreements between the EC and eastern Europe evolve.

And when Japanese investment does come, many predict it will not take the form of joint ventures with existing enterprises. Instead, Japanese manufacturers will be more likely to put money into greenfield sites once many of the east's worst infrastructural problems have been tackled. "After everything is settled, the Japanese will come in and develop new sites," says one Treuhand official in a comment widely echoed throughout the region. "Even if they end up paying more down the road, they'd rather wait until they can operate in stability."

If that proves true, it is unlikely to improve the sharp trade frictions between Europe and Japan. The last thing governments in either the EC or Japan want is the spectacle of west European taxpayers and companies underwriting the heavy costs of reconstructing eastern Europe, and then having to watch their Japanese competitors waltz in once the hard work has been done.

The Japanese government, aware of the problem, has taken steps to prevent it. In a much publicized trip to Poland and Hungary early in 1990, Prime Minister Toshiki Kaifu offered each country \$500 million in credits to support structural adjustment and direct corporate investment. But Japanese companies have had the last word. More than 18 months after Kaifu's offer of assistance, not a single company had drawn on the low-priced credits to invest in the east.

Nevertheless, their export drive continues. West European companies now face the same stiff competition from the Japanese, the South Koreans and other low cost East Asian producers for the hearts and minds of new consumers in eastern Europe as they are accustomed to facing at home.

Sony Announces First Japanese Plant in Eastern Germany

92WS0208C Brussels EUROPE in English
22 Nov 91 p 17

[Article: "(EU) Sony: First Japanese Plant in Eastern Germany"]

[Text] Electronics

The Japanese company Sony plans to establish a plant in the industrial zone of Jena (ex-GDR) for the production of televisions and audio-visual equipment intended for East European markets. The project, however, is contingent upon future developments in the electronic consumer product markets. The project was announced in The Hague by Mr. Akio Morita, Sony President. He is member of the Japanese industrial federal delegation Keidanren which is currently visiting Europe. A few days ago, the delegation was received by Chancellor Kohl who urged Japanese businessmen to invest in Eastern Germany. Sony already operates 10 production units in six European countries. If the Jena project sees the light of day, it will be the first time a Japanese company becomes

established in Eastern Germany. Sony is apparently also planning to transfer its main European establishment from Cologne to Berlin.

Mercedes To Invest in Japan

92WS0167A Brussels EUROPE in English
28-29 Oct 91 p 18

[Article: "(EU) Cars"]

[Text] The German group Mercedes-Benz AG (Stuttgart) will invest some 270 million German marks in the next few years in Japan to set up a central spare parts warehouse. It will also build two centres which will adapt German cars to specific Japanese requirements, which up to now has been handled by the partner YANASE. The German group is the largest exporter of cars to Japan, which are sold for the most part by the 180 agents of the YANASE network.

Europe/Japan: Future Semiconductor Industry Competitiveness Compared

92WS0071B Duesseldorf VDI NACHRICHTEN
in German 11 Oct 91 p 2

[Article by Jens D. Billerbeck: "Japan Controls High-Tech Area: Europe's Infotechnology Faces Bleak Future"]

[Text] Kiel, 11 Oct 91. "The current research programs Esprit [European Strategic Program for Research and Development in Information Technologies], Eureka [European Research Coordination Agency], and Jessi [Joint European Submicron Silicon Initiative] will have no influence at all on the creation of a competitive European semiconductor industry." This is the sober evaluation of Dr. Robert R. Heikes, cochairman of the European semiconductor manufacturer ESZ, who accuses these programs of being a misuse of research funding.

In his estimation they will do nothing to change the fact that Europe is falling into technological dependency on Japan, with the result that industry here will not draw its net value from high-tech products but from labor. According to Heikes, "Workers are Europe's future source of income. There will be good jobs, but the fundamental decisions will be made in Japan and the jobs with the highest qualifications will be located in Japan."

Heikes was a participant in a discussion on perspectives for a new technology policy held recently in Kiel and attended by economic and technical experts. The invitations were issued by the "Schleswig-Holstein Think Tank," which was founded by minister-president Bjoern Engholm.

Semiconductors are the base components of infotechnology, whose key role for European competitiveness was underlined by many discussants. But their assessment assigns Europe only a small role, although, according to Heikes, approximately 50 percent of all new jobs will be in the areas of infotechnology by the end of the 90's.

Professor Hans-Joachim Queisser of the Max Planck Institute for Solid State Physics Research in Stuttgart makes it clear how serious the situation is: in theory there could be eight to 10 million more jobs available even today, if the chance to take a leading role had not been allowed to slip away. He too directs his criticism at an economic and goal-setting policy which supports and maintains technologies "from Kaiser Wilhelm's days" while innovative businesses are often left to deal with their difficulties on their own. He says that in 40 years democracy has not managed to bring about a significant shift in economic policy. His heart sinks when he looks at how Japan and the USA are preparing for the coming century.

He gave as examples the great laboratories of Bell, AT&T and the Japanese telecommunications giant NTT, where very costly research with immediate applicability is being done. In contrast, the Federal postal service's laboratory in Darmstadt, for instance, has never come close to being in that class, because the profits from telephone use go into the Federal budget and not into research.

But it is not only a matter of gloomy portrayals of the status quo; instead, the question arises of whether there are alternatives to the current situation. For the semiconductor specialist Heikes, the opportunity lies in Europe-wide bundling of resources. He says that the European semiconductor industry must be rationalized, and the Big Three (SGS-Thomson, Siemens and Philips) must be amalgamated in order to reach the necessary critical mass. About \$100 billion will have to be invested before the year 2000 in order to avert the threatened colonization of Europe by Japan. He noted that that was exactly one-tenth of the agricultural subsidy.

But joining forces is no panacea, as Professor Herbert Giersch warns. He is the former director of the Institute for World Economics in Kiel. For him, the collapse of the industrial superstructures in Eastern Europe is a clear warning. The larger an economic structure grows, he says, the more complex the management structures become, and the greater the danger of inflexibility. He too recognizes the dominance of Japan in infotechnology, but contrasts it with the leading position of Europe, and in particular of Germany, in chemistry and mechanical engineering. To maintain this position, however, will scarcely be possible without modern electronics.